SEW EURODRIVE

Product Manual

Inverter

MOVITRAC® basic

Edition 04/2025

31982182/EN

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1 General information

1.1 About this documentation

The documentation at hand is the original.

This documentation is an integral part of the product. The documentation is intended for all employees who perform work on the product.

Make sure this documentation is accessible and legible. Ensure that persons responsible for the systems and their operation as well as persons who work on the product independently have read through the documentation carefully and understood it. If you are unclear about any of the information in this documentation or if you require further information, contact SEW-EURODRIVE.

1.2 Other applicable documentation

Refer to the corresponding documentation for all other components.

Always use the latest edition of the documentation and software.

The SEW-EURODRIVE website (www.sew-eurodrive.com) provides a wide selection of documents for download in various languages. If required, you can order printed and bound copies of the documentation from SEW-EURODRIVE.

1.3 Structure of the safety notes

1.3.1 Meaning of signal words

The following table shows the graduation and meaning of the signal words in the safety notes.

Signal word	Meaning	Consequences if not observed
⚠ **DANGER**	Imminent danger	Death or severe injuries
⚠ **WARNING**	Possibly dangerous situation	Death or severe injuries
⚠ **CAUTION**	Possibly dangerous situation	Minor injuries
NOTICE	Possible damage to property	Damage to the product or its environment
INFORMATION	Useful information or tip: Simplifies handling of the product.	

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1.3.2 Structure of section-related safety notes

Section-related safety notes do not apply to a specific action but to several actions pertaining to one subject. The hazard symbols used either indicate a general hazard or a specific hazard.

This is the formal structure of a safety note for a specific section:

SIGNAL WORD

Type and source of hazard.

Possible consequence(s) if disregarded.

- Measure(s) to prevent the hazard.

1.3.3 Meaning of the hazard symbols

The hazard symbols in the safety notes have the following meaning:

Hazard symbol	Meaning
	General hazard
	Warning of dangerous electrical voltage
	Warning of hot surfaces
	Warning of automatic restart

1.3.4 Structure of embedded safety notes

Embedded safety notes are directly integrated into the instructions just before the description of the dangerous step.

This is the formal structure of an embedded safety note:

⚠ **SIGNAL WORD!** Type and source of danger. Possible consequence(s) if disregarded. Measure(s) to prevent danger.

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1.4 Decimal separator in numerical values

In this document, a period is used to indicate the decimal separator.

Example: 30.5 kg

1.5 Rights to claim under limited warranty

Read the information in this documentation. This is essential for fault-free operation and fulfillment of any rights to claim under limited warranty. Read the documentation before you start working with the product.

1.6 Recycling, reprocessing, reuse

When manufacturing products, SEW-EURODRIVE makes sure to keep the use of new natural resources to a minimum in the interests of the circular economy. Key aspects here are the recycling of materials as well as the inspection and/or processing of returned components and their reuse in new products. These processes are only used at SEW-EURODRIVE if the resulting materials and components correspond to the quality of new products.

1.7 Product names and trademarks

The product names mentioned in this documentation are trademarks or registered trademarks of the respective titleholders.

1.8 Copyright notice

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2 Safety notes

2.1 Preliminary information

The following general safety notes serve the purpose of preventing injury to persons and damage to property. They primarily apply to the use of products described in this documentation. If you use additional components, also observe the relevant warning and safety notes.

2.2 Duties of the user

As the user, you must ensure that the basic safety notes are observed and complied with. Make sure that persons responsible for the machinery and its operation as well as persons who work on the device independently have read through the documentation carefully and understood it.

As the user, you must ensure that all of the work listed in the following is carried out only by qualified specialists:

- Setup and installation
- Installation and connection
- Startup
- Maintenance and repairs
- Shutdown
- Disassembly

Ensure that the persons who work on the product pay attention to the following regulations, conditions, documentation, and information:

- The national and regional regulations governing safety and the prevention of accidents
- Product safety label on the product
- All other associated project planning documents, installation and startup instructions, as well as connection and wiring diagrams
- Do not assemble, install, or operate damaged products
- All system-specific specifications and regulations

Ensure that systems in which the product is installed are equipped with additional monitoring and protection devices. Observe the applicable safety regulations and legislation governing technical work equipment and accident prevention regulations.

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2.3 Target group

Specialist for mechanical work

Any mechanical work may be performed only by adequately qualified specialists. Specialists in the context of this documentation are persons who are familiar with the design, mechanical installation, troubleshooting, and maintenance of the product, and who possess the following qualifications:

- Qualifications in the field of mechanics in accordance with the national regulations
- Familiarity with this documentation

Specialist for electrotechnical work

Any electrotechnical work may be performed only by electrically skilled persons with a suitable education. Electrically skilled persons in the context of this documentation are persons who are familiar with electrical installation, startup, troubleshooting, and maintenance of the product, and who possess the following qualifications:

- Qualifications in the field of electrical engineering in accordance with the national regulations
- Familiarity with this documentation

Additional qualifications

In addition to that, these persons must be familiar with the valid safety regulations and laws, as well as with the requirements of the standards, directives, and laws specified in this documentation.

The persons must have the express authorization of the company to operate, program, parameterize, label, and ground devices, systems, and circuits in accordance with the standards of safety technology.

Instructed persons

All work in the areas of transport, storage, installation, operation and waste disposal may only be carried out by persons who are trained and instructed appropriately. These instructions must enable the persons to carry out the required activities and work steps safely and in accordance with regulations.

2.4 IT security

2.4.1 Contact

If you need support with the configuration, contact SEW-EURODRIVE Service. You can obtain information about the latest security-related problems via e-mail (cert@sew-eurodrive.com) or by visiting the Product Security Management website (http://go.sew/psm). You will find various contact options there for reporting security-related problems.

2.4.2 IT security of the product

The product can be set to different access levels. Certain parameters are protected by these access levels. Authentication is implemented by using static access data. This data is not used to defend against attacks on IT security but to protect against unintentional modification.

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2.4.3 IT security of the environment

For drive and control components that are integrated in a network (e.g., fieldbus, WLAN or Ethernet network), settings can even be made from more remote locations. This brings with it the risk of a parameter change not visible externally resulting in unexpected, but not uncontrolled system behavior and this may impact negatively on operational safety and reliability, system availability or data security.

With WLAN or Ethernet-based networked systems and engineering interfaces in particular, make sure that unauthorized access is not possible. Using IT-specific security standards, such as network segmentation, adds to the protection of access to the ports. For an overview of the ports and of the services provided by the communication interfaces, refer to Online Support. The IT security of the product is only guaranteed when used in an environment secured by defense-in-depth strategies.

Ensure that clear responsibility for security is guaranteed during operation. SEW-EURODRIVE recommends an IT security management system in accordance with ISO/IEC 27001 and ISO/IEC 62443-2-4.

2.5 Designated use

The product is intended for control cabinet installation in electrical systems or machines.

In case of installation in electrical systems or machines, startup of the product is prohibited until it is determined that the machine meets the requirements stipulated in the local laws and directives. For Europe, Machinery Directive 2006/42/EC as well as the EMC Directive 2014/30/EU apply. Observe EN 60204-1 (Safety of machinery - electrical equipment of machines). The product meets the requirements stipulated in the Low Voltage Directive 2014/35/EU.

The standards given in the declaration of conformity apply to the product.

The systems can be mobile or stationary.

Only connect ohmic/inductive loads.

The product can be used to operate the following motors in industrial and commercial systems:

- AC asynchronous motors
- AC synchronous motors

Technical data and information on the connection conditions are provided on the nameplate and in chapter "Technical data" in the documentation. Always comply with the data and conditions.

Unintended or improper use of the product may result in severe injury to persons and damage to property.

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2.5.1 Restrictions under the European WEEE Directive 2012/19/EU

Options and accessories from SEW-EURODRIVE may only be used in combination with products from SEW-EURODRIVE.

2.5.2 Lifting applications

The product may not be used for lifting applications or on slopes.

2.5.3 Restrictions of use

The following applications are prohibited unless the device is explicitly designed for such use:

- Use in potentially explosive areas
- Use in areas exposed to harmful oils, acids, gases, vapors, dust, and radiation
- Operation in applications with impermissibly high mechanical vibration and shock loads in excess of the regulations stipulated in EN 61800-5-1.
- Use at an elevation of more than 3800 m above sea level.

In addition, observe the restrictions of use in the **product manual** > chapter "Technical data" > "General technical data" (→ 🗎 31).

2.6 Transport

Inspect the shipment for damage as soon as you receive the delivery. Inform the shipping company immediately about any damage. If the product or the packaging is damaged, do not assemble, install, connect, or start up the product. If the packaging is damaged, the product itself may also be damaged.

Observe the following notes when transporting the device:

- Ensure that the product is not subject to mechanical impact.
- Only place the product lying on the heat sink during transport.
- Always use all attachment points if available. The attachment points are designed to carry only the mass of the product. Do not apply any additional loads.

If necessary, use suitable, adequately dimensioned transport aids.

Observe the notes on the climatic conditions in accordance with chapter "Technical data" in the corresponding product manual.

2.7 Creating a safe working environment

Before you work on the product, ensure a safe working environment. Observe the following basic safety notes:

2.7.1 Performing work on the product safely

Defective or damaged product

Never install defective or damaged products. Observe the following information to avoid injuries or damage:

- Before installation, check the product for external damage and replace a damaged product.

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Hot surfaces

The surfaces of the product can become very hot during operation. Observe the following information to avoid burns:

- Let the product and its accessories cool down before touching it.
- Do not touch any surfaces of the product during operation, except for the control elements.
- Observe the information signs and product safety labels on the product.

Falling load

Observe the following information to avoid death or severe injury due to falling loads:

- Do not stand under the load.
- Secure the area where loads can fall down.
- Use personal protective equipment (such as helmet and safety shoes).
- Use a suitable lifting tool (chain hoist, forklift) and transport protection.

Rotating parts

When working on the product, there may be a risk of exposed rotating parts and uncontrolled movement of the components. Observe the following information to avoid body parts getting crushed or pulled in:

- Switch off the product before you start working on it.
- Observe all technical data of the product.
- Do not reach into the hazard zone.
- Observe the 5 safety rules.

Sharp edges

Observe the following information to avoid cuts caused by sharp or non-deburred cutting edges:

- Wear safety gloves.

2.7.2 Performing electrical work safely

Observe the following information to perform electrical work safely:

Electrical work may only be performed by an electrically skilled person or an electronically instructed person under the supervision of an electrically skilled person.

The fact that the operation or display elements are no longer illuminated does not indicate that the product has been disconnected from the supply system and no longer carries any voltage.

Live parts

Always adhere to the 5 safety rules for all work on electrical components:

1. Disconnect.
2. Secure the device against a restart.
3. Check that no voltage is applied.
4. Ground and short-circuit.
5. Cover or isolate neighboring live parts.

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Depending on the situation, it is possible to deviate from rules 4 and 5. Observe standard EN 50110-1.

Dangerous voltage

When the system is switched on, dangerous voltages are present at all power connections as well as any cables and terminals that are connected. This is also the case even if the product is inhibited. Observe the following information to avoid the risk of electric shock:

- Do not touch any exposed live parts (e.g. male contacts, connectors, terminals).
- Secure all open live components with a touch guard.
- Before applying the supply voltage, make sure that all required covers are mounted.

Danger due to electric arc

An electric arc may occur when plug-in connections are disconnected or connected while voltage is applied (e.g. connection between drive and inverter). In order to avoid damaging electrical components, observe the following information:

- Do not disconnect power connections during operation.
- Do not connect power connections during operation.
- Ensure that the product is de-energized before disconnecting and connecting the plug-in connections.

Damage to property due to damaged or loose cables

To avoid damaging electrical components (e.g. cables and plug-in connections), observe the following information:

- Do not insert plug-in connections if cables are subjected to tensile stress.
- Do not kink cables when connecting plug-in connections.
- Replace loose or defective plug-in connections.
- Make sure that cables are not pinched or crushed.
- Do not run cables near or along a sharp edge.

Dangerous voltage due to charged capacitors

Voltage from charged capacitors can still be present in live components or power connections after disconnecting from the supply voltage. Observe the following information:

- Observe the following waiting period after disconnecting the supply voltage and before performing any electrical work: **10 minutes**.
- Ensure that the unit is de-energized.
- Observe the information signs and product safety labels on the product.

2.8 Installation/assembly

Ensure that the product is installed and cooled in accordance with the regulations in the documentation.

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Protect the product from excessive mechanical strain. The product and its mounted components must not protrude into the path of persons or vehicles. Ensure that no components are deformed or no insulation spaces are modified, particularly during transportation. Electrical components must not be mechanically damaged or destroyed.

2.9 Protective separation

The product meets all requirements for protective separation of power and electronics connections in accordance with IEC 61800-5-1. The connected signal circuits must meet requirements according to SELV (**S**afety **E**xtra **L**ow **V**oltage) or PELV (**P**rotective **E**xtra **L**ow **V**oltage) to ensure protective separation. The installation must meet the requirements for protective separation.

In order to avoid exceeding the permitted contact voltages in SELV or PELV power circuits in the event of a fault, continuous equipotential bonding is required in the vicinity of these power circuits. If this is not possible, other protective measures must be taken. These protective measures are described in IEC 61800-5-1.

2.10 Electrical installation

Ensure that all of the required covers are correctly attached after the electrical installation.

Make sure that preventive measures and protection devices comply with the applicable regulations (e.g. EN 60204-1 or EN 61800-5-1).

2.10.1 Stationary application

The necessary preventive measure for the product is:

Type of energy transfer	Preventive measure
Direct power supply	Ground connection

2.10.2 Regenerative operation

The drive is operated as a generator due to the kinetic energy of the system/machine. Before opening the connection box, secure the output shaft against rotation.

2.11 Startup/operation

Make sure the connection boxes are closed and screwed before connecting the supply voltage.

Depending on the degree of protection, products may have live, uninsulated, and sometimes moving or rotating parts as well as hot surfaces during operation.

Additional preventive measures may be required for applications with increased hazard potential. Be sure to check the effectiveness of the protection devices after every modification.

In the event of deviations from normal operation, switch off the product. Possible deviations are increased temperatures, noise, or vibration, for example. Determine the cause. Contact SEW-EURODRIVE if necessary.

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Risk of burns due to arcing: Do not disconnect power connections during operation. Do not connect power connections during operation.

When the system is switched on, dangerous voltages are present on all voltage-controlled product parts as well as any cables and terminals that are connected. This also applies even when the product is inhibited and the motor is in an idle state. Do not touch the components during operation.

If you disconnect the product from the voltage supply, do not touch any live components or power connections because capacitors might still be charged. Observe the following minimum switch-off time:

10 minutes.

Observe the corresponding information signs on the product.

The fact that the operation or display elements are no longer illuminated does not indicate that the product has been disconnected from the supply system and no longer carries any voltage.

Mechanical blocking or internal protective functions of the product can cause a motor standstill. Removing the cause of this problem or performing a reset can result in the machine or the system re-starting on its own. First, disconnect the product from the supply system before you start troubleshooting.

Risk of burns: The surface temperature of the product can exceed 60 °C during operation. Do not touch the product during operation. Let the product cool down before touching it.

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3 Product description

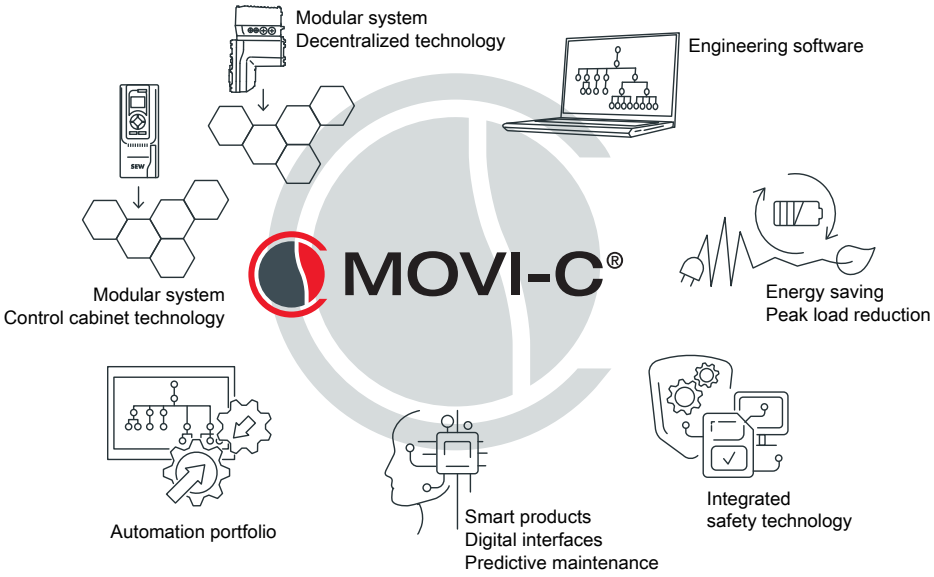
3.1 MOVI-C® modular automation system

MOVI-C® is the modular automation system that allows for the highest level of plant and machine automation. MOVI-C® comprises drive technology, Motion Control, control technology and visualization.

Modular, end-to-end, and scalable: The MOVI-C® modular automation system is your one-stop shop for every automation task. One manufacturer – one end-to-end solution: including services, hardware and software, from planning and startup to operation and servicing. SEW-EURODRIVE offers you maximum relief, future-proofing and the reassuring feeling of always having a contact person you can rely on.

3.1.1 Overview

MOVI-C® is a holistic concept consisting of the following building blocks:



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3.2 MOVITRAC® basic

3.2.1 Overview

MOVITRAC® basic is the inverter for a direct line connection, suitable for simple speed control of asynchronous motors. The product series can be used for the direct connection to controllers via industrial communication networks such as PROFINET, EtherNet/IP™, Modbus TCP, or EtherCAT®/SBus^{PLUS}. This is done via pluggable gateways and communication modules. In addition, a basic variant is available exclusively for control via digital and analog inputs.

The inverter comprises the following components:

- Basic unit with or without fan
- Optional keypads
- Accessories for EMC-compliant installation
- Optional gateways for connection to industrial communication networks

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- Communication module for connecting the gateways with up to 7 additional inverters
- CDM11A diagnostic module for connecting to the MOVISUITE® engineering software
- Accessories for connecting and controlling motors and brakes
- Prefabricated motor cables

3.2.2 Options

Options	Chapter
CBG01A keypad	"Description and technical data" (→ 🗎 45)
CBG11A keypad	"Description and technical data" (→ 🗎 46)
CBG21A keypad	"Description and technical data" (→ 🗎 47)
CBG22A local keypad	"Description and technical data" (→ 🗎 49)
CDM11A diagnostic module **INFORMATION:** The CDM11A diagnostic module is required as an adapter for the CBG11A, CBG21A, and CBG22A keypads.	"Description and technical data" (→ 🗎 44)
COG11A door mounting frame	"Description" (→ 🗎 50)
CFX11A-S gateway for EtherCAT®/SBus^{PLUS}	"Description and technical data" (→ 🗎 42)
CFX11A-E gateway for EtherNet/IP and Modbus TCP	"Description and technical data" (→ 🗎 39)
CFX11A-N gateway for PROFINET	"Description and technical data" (→ 🗎 40)
CFC11A communication module	"Description and technical data" (→ 🗎 43)

INFORMATION

Only the CBG21A keypad can be used on the gateways.

INFORMATION

No keypads can be used for devices with the CFC11A communication module. Communication takes place only centrally via the gateway.

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3.2.3 Accessories

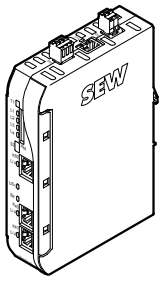
Accessories	Chapter
CNF.. line filter	"Description and technical data" (→ 🗎 54)
Prefabricated cables	"Description and technical data" (→ 🗎 77)

3.2.4 Overview of variants

The following table lists the available inverters.

Type designation	Line voltage in V	Output current in A	P_{ASM} at 400 V in kW
MCB91A-0025-5D3-2..	3 × AC 200 – 500	2.5	0.75
MCB91A-0040-5D3-2..	3 × AC 200 – 500	4	1.5
MCB91A-0034-2D1-2..	1 × AC 200 – 240	3.4	0.55
MCB91A-0042-2D1-2..	1 × AC 200 – 240	4.2	0.75

3.3 MOVI-C® CONTROLLER

MOVI-C® CONTROLLER	
MOVI-C® CONTROLLER UHX15A (in preparation) 	**Properties:** • Recommended number of axes: 2 interpolated, 1 other not interpolated[1)] • Maximum 3 axes can be connected • EtherCAT®/SBus^{PLUS} system bus (maximum number of stations: 128) • Device connection via EtherNet/IP™, Modbus TCP, PROFINET IO • Safe PD routing – PROFIsafe: maximum 3 axes • Ethernet interface for engineering tasks and TCP/IP and UDP via IEC 61131-3 • Memory: SD memory card with 512 MB for quick change • Web visualization via IEC • Large selection of MOVIKIT® software modules for motion control Further information can be found in the following documents: • "MOVI-C® CONTROLLER UHX15A" manual • "MOVI-C® – Automation with MOVI-C® CONTROLLER" manual

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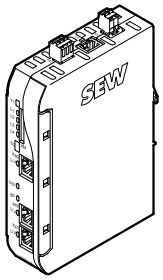
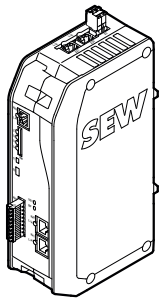
MOVI-C® CONTROLLER	
MOVI-C® CONTROLLER UHX25A 	**Properties:** • Recommended number of axes: 2 interpolated, 8 other not interpolated[1)] • EtherCAT®/SBus^{PLUS} system bus (maximum number of stations: 128) • Device connection via EtherNet/IP™, Modbus TCP, PROFINET IO • Safe PD routing – PROFIsafe: maximum 8 axes • Ethernet interface for engineering tasks and TCP/IP and UDP via IEC 61131-3 • Memory: SD memory card with 512 MB for quick change • Web visualization via IEC • Large selection of MOVIKIT® software modules for motion control Further information can be found in the following documents: • "MOVI-C® CONTROLLER standard UHX25A" manual • "MOVI-C® – Automation with MOVI-C® CONTROLLER" manual
MOVI-C® CONTROLLER UHX45A 	**Properties:** • Recommended number of axes: 8 interpolated, 8 other not interpolated[1)] • System bus EtherCAT®/SBus^{PLUS} (maximum number of stations: 128) • Device connection via EtherNet/IP™, Modbus TCP, PROFINET IO • Safe PD routing – PROFIsafe: maximum 8 axes • Ethernet interface for engineering tasks and TCP/IP and UDP via IEC 61131-3 • Memory: SD memory card with 512 MB for quick change • Web visualization via IEC • Large selection of MOVIKIT® software modules for motion control Further information can be found in the following documents: • "MOVI-C® CONTROLLER advanced UHX45A" manual • "MOVI-C® – Automation with MOVI-C® CONTROLLER" manual

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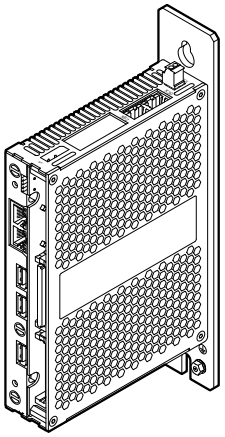
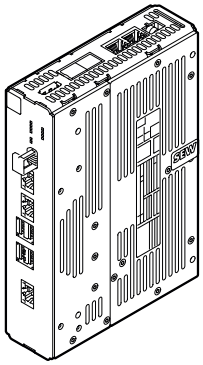
MOVI-C® CONTROLLER	
MOVI-C® CONTROLLER UHX65A 	**Properties:** • Recommended number of axes: 16 interpolated, 16 other not interpolated[1)] • Connected by hypervisor technology, a 2nd Windows 10 IoT operating system (for the 4-core variant) with corresponding Ethernet interface (optional) • Ethernet interface for engineering tasks or TCP/IP and UDP via IEC 61131-3 • System bus EtherCAT®/SBus^{PLUS} (maximum number of stations: 256) • Device connection via EtherNet/IP™, Modbus TCP, PROFINET IO (optional) • Connection as EtherNet/IP™ scanner or PROFINET IO controller (optional) • Safe PD routing – PROFIsafe: maximum 24 axes • Memory: CFast memory card with 2 GB for quick change • Visualization via Windows or web visualization via IEC • Large selection of MOVIKIT® software modules for motion control Further information can be found in the following documents: • "MOVI-C® CONTROLLER progressive UHX65A" manual • "MOVI-C® – Automation with MOVI-C® CONTROLLER" manual
MOVI-C® CONTROLLER UHX86A 	**Properties:** • Recommended number of axes: More than 32 interpolated, more than 32 others not interpolated[1)] • Second operating system connected by hypervisor technology with 2 corresponding Ethernet interfaces (optional) • Ethernet interface for engineering tasks or TCP/IP and UDP via IEC 61131-3 • System bus EtherCAT®/SBus^{PLUS} (maximum number of stations: 256) • Device connection via EtherNet/IP™, Modbus TCP, PROFINET IO (optional) • Connection as EtherNet/IP™ scanner or PROFINET IO controller (optional) • Safe PD routing – PROFIsafe: maximum 24 axes • Memory: CFast memory card with 2 GB for quick change • Memory for Windows 10 IoT: SSD card with 128/256/480 GB (optional) • Visualization via Windows or web visualization via IEC • Large selection of MOVIKIT® software modules for motion control • Integrated Safety over EtherCAT® controller S05A (optional) Further information can be found in the following documents: • "MOVI-C® CONTROLLER UHX86A" manual (in preparation) • "MOVI-C® – Automation with MOVI-C® CONTROLLER" manual

1) Number of axes subject to the size of the user program in MOVIRUN® flexible and without specifying the minimum clock cycle time (not strictly limited).

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3.4 Technologies

Various technologies are used for inverters in the MOVI-C® modular automation system.

3.4.1 MOVI-C® CONTROLLER

MOVI-C® CONTROLLERs are the controllers made by SEW-EURODRIVE. They are optimized for gateway, motion, automation, or cyber-physical control tasks. MOVI-C® CONTROLLERs can be linked to the higher-level controller of a machine cell or system using classic PROFINET, EtherNet/IP™, or Modbus TCP fieldbus systems. Alternatively, they can realize the automation of entire machines and systems as independent controllers. In this case, as the masters, MOVI-C® CONTROLLERs take over smooth communication with the lower-level devices, e.g. MOVIDRIVE® inverters, and their clock-synchronous connection via EtherCAT®/SBus^{PLUS} or PROFINET.

A wide range of performance classes is available. All versions have a compact design, meaning they can fit into even small machine control cabinets.

The added value that really counts in terms of reducing complexity comes from the integrated MOVIKIT® software modules. This software gives you, as a user, more freedom to customize parameters while reducing your outlay on programming. MOVIKIT® software modules solve complex tasks such as positioning, load distribution, anti-oscillation control, or synchronization, and complete automation tasks such as robotics or storage/retrieval systems.

3.4.2 Industrial cybersecurity

With increasing networking and the associated variety of internal and external access requirements, the importance of suitable protection concepts is growing.

It is not only users of critical infrastructures who must comply with minimum cybersecurity standards in IT and OT networks and protect their systems against cyber attacks. Supply chain security is particularly important, from component manufacturers, mechanical engineering companies and system integrators, through to the user's service provider.

- SEW-EURODRIVE has been certified by TÜV NORD for its Product Security Management and processes for a Secure Development Lifecycle (SDL) in accordance with IEC 62443-4-1 since 2021.
- Via the central CERT mailbox cert@sew-eurodrive.com, SEW-EURODRIVE guarantees a quick response to messages or inquiries about cybersecurity incidents within its scope of delivery.
- SEW-EURODRIVE ensures security advisories are automatically sent to customers and system operators who are registered on its mailing list.

3.4.3 Software tools

To support planning, ordering, delivery, startup, operation, and maintenance through to shutdown, SEW-EURODRIVE offers tools for online operation or for installation on the on-site computer.

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3.4.4 Customization

Text that can be freely selected by the customer can be printed on the device nameplate of the inverters. This maximum 50-character text can be, for example, the company name, the purchase order number, or a material number of the customer. In addition, the text is saved to parameters in the inverter and is electronically available, for example, for automatic inventory.

3.4.5 Parameters ex works

SEW-EURODRIVE offers the ordering of products with customer-specific parameter settings in the delivery state. This option is known as "ex works parameters". Startup procedures and processes can be optimized in the best possible way using this option. Products with a customer-specific parameter set are marked with .../P... in the type designation.

3.5 Setpoint processing

3.5.1 MOVIKIT® Drive

MOVIKIT® software modules are standardized control programs with a defined process data interface and a user-friendly configuration and diagnostics interface.

The "Drive" category includes MOVIKIT® software modules that provide single-axis functionalities and are operated directly on the inverter.

As a rule, the MOVIKIT® software modules are operated by a higher-level third-party controller via process data and cover a wide range of applications from speed-controlled applications, for example in materials handling technology, to positioning applications. No programming knowledge is required to use the MOVIKIT® Drive software modules. There is guided startup and a user-friendly operating and diagnostics interface is available.

Properties:

- Wide range of functions
- User-friendly user interface
- Input of parameters required only for the application
- Guided parameterization instead of complicated programming
- No programming experience required
- Simple training, therefore quick project planning and startup
- All motions are controlled directly in the inverter

3.5.2 FCB concept

The FCB (function control block) concept describes the modular firmware design of inverters from the MOVI-C® modular automation system. This feature ensures that a wide range of drive functions can be selected or deselected quickly and easily using control words. All primary functions, i.e. functions that move or control the motor, are designed as individual FCBs that have to be selected to perform a specific task, e.g. positioning. You can switch between different FCBs at any time. Switching to another FCB takes place with a maximum delay of 0.5 ms. Different priorities are assigned to the FCBs. If an FCB with a higher priority than the currently active FCB is selected, the FCB with the higher priority is activated.

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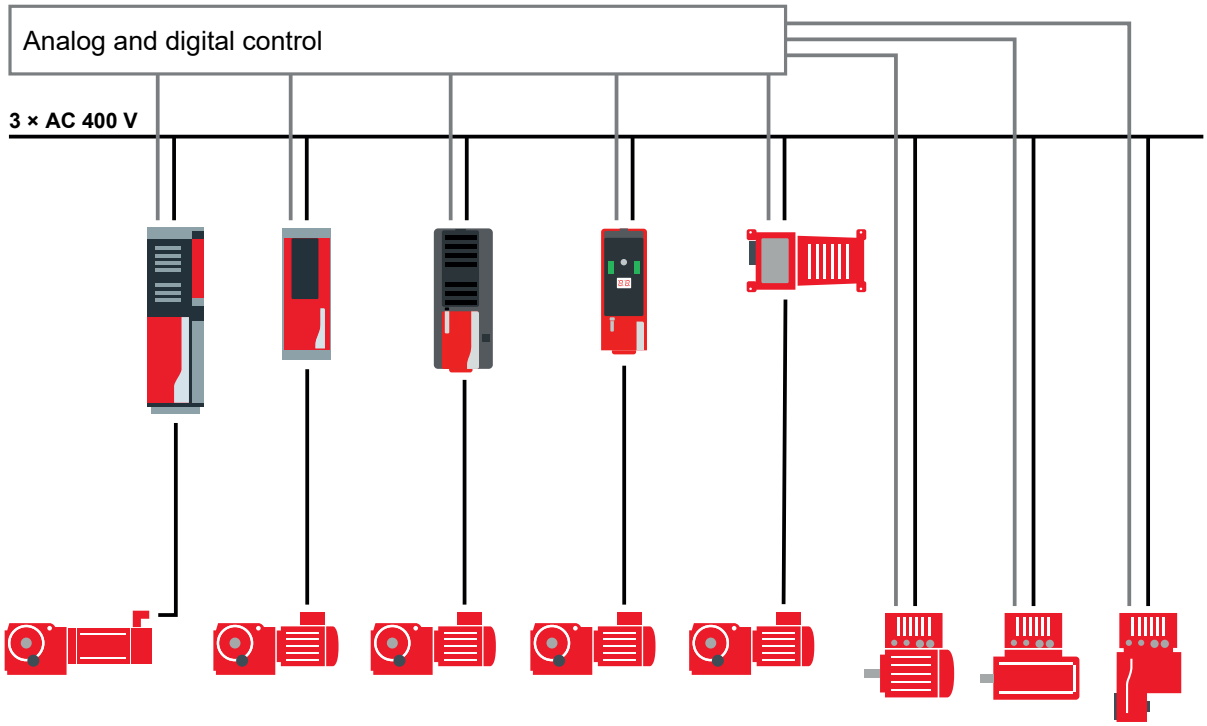
3.6 Control topologies

The inverters can be controlled in different ways depending on the requirements.

3.6.1 Terminal control



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In simple applications, it is often sufficient to control the inverters via digital or analog inputs. Each axis is controlled individually, e.g. via switches, pushbuttons, and potentiometers. Depending on the variant, the inverters from the MOVI-C® modular automation system have a different number of digital inputs and outputs, analog inputs and outputs, and relays and can be controlled via these.

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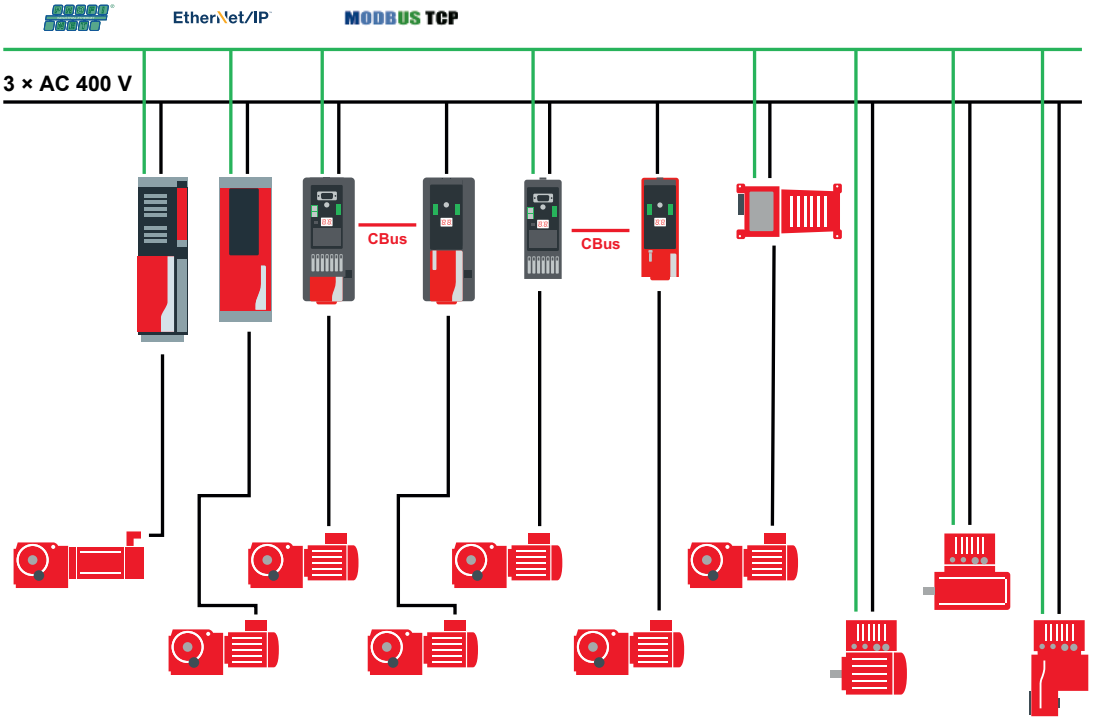
3.6.2 Single-axis automation



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The following devices are connected directly to the higher-level master via fieldbus interfaces:

- MOVIDRIVE® technology inverter
- MOVITRAC® advanced inverter
- MOVIGEAR® performance decentralized drive unit
- MOVIMOT® advanced decentralized drive unit
- MOVIMOT® performance decentralized drive unit
- MOVIMOT® flexible decentralized inverter

The following devices are indirectly connected to the higher-level master on an individual basis via gateways or gateway plus connected communication modules:

- MOVITRAC® classic inverter
- MOVITRAC® basic inverter

The drive function is delivered at speed and safely with graphic editors using the predefined MOVIKIT® Drive software modules. Each drive axis is controlled individually via the network.

Data is stored, for example, via a data exchange function on a memory card (if available).

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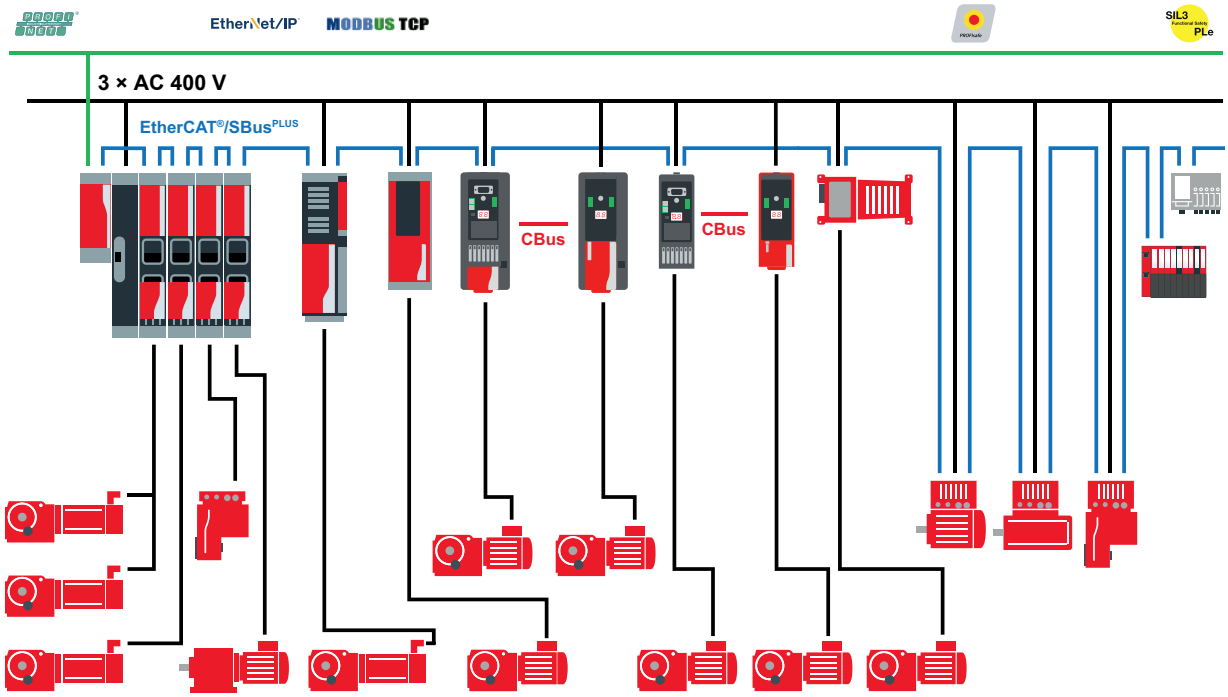
3.6.3 Motion control or module automation



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If the control cabinet inverters of the MOVI-C® modular automation system are connected directly (without gateway) to the MOVI-C® CONTROLLER via EtherCAT®/ SBus^{PLUS}, they have a real-time-capable connection.

The MOVI-C® CONTROLLER receives setpoints, e.g. for single-axis motions, from the higher-level master via the fieldbus. The MOVI-C® CONTROLLER determines the setpoints for the connected inverters, thereby taking care of tasks such as phase-synchronous operation, electronic cam function, and kinematics.

Predefined MOVIKIT® software modules are used to implement the motion control drive function quickly and reliably with the aid of graphic editors. Thanks to more than 50 kinematic models, a large number of mechanical configurations are already covered. New functions for kinematic models can be custom-made by SEW-EURODRIVE. Data is stored via a data exchange function on a memory card in the MOVI-C® CONTROLLER.

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3.7 Motor control

3.7.1 Operable motors

Operable motors include:

- Asynchronous motors

For further information, refer to chapter "Project planning" (→ 🗎 57).

3.7.2 Control mode

The characteristics of the motor connected to the inverter are influenced by the control modes used.

LVFC

The LVFC control mode is intended for easy open-loop operation of asynchronous motors without encoder feedback. The procedure operates an asynchronous machine on a parameterizable voltage/frequency characteristic. To keep the magnetizing current on a constant level, the voltage (V) is adjusted in proportion to the frequency (f).

The current slip is calculated and can be compensated.

The LVFC control mode is suitable for applications with a limited speed setting range, where no dynamic step changes in load occur and where there are small requirements regarding the control characteristics.

The LVFC control mode is suitable for group drives. A group drive is an electrical parallel connection of several identical or different motors at one inverter. The motors do not have a rigid mechanical connection.

3.7.3 Motor protection

The inverters of the MOVI-C® modular automation system offer thermal motor protection with temperature sensors in the motor.

For more information, refer to chapter "Thermal motor protection" (→ 🗎 60).

3.7.4 Energy-saving function

The inverter of the MOVI-C® modular automation system offers the following function for saving energy:

- Application-specific speed adjustment

3.7.5 Group drives

The inverters of the MOVI-C® modular automation system enable parallel connection and operation of several motors with identical speed.

3.7.6 DC braking

With DC braking, the asynchronous motor brakes via current injection. The motor brakes without a braking resistor on the inverter.

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3.8 Technology functions

The basic functions of the inverters can be adapted to the application via the parameter settings. Technology functions can be used to extend the basic functions.

3.8.1 Counter function

The counter function counts edge changes at a digital input of the inverter. By setting parameters, you can define which edges are counted in which direction. The counter increases or decreases the value by 1 with each edge change. The counter value is stored in volatile memory. The counter is reset to 0 after the inverter is switched off and on again.

3.8.2 PID controller

The PID controller acts as an independent controller that calculates a control difference on the basis of a setpoint and actual value, and compensates for it. You can use the PID controller for temperature control, pressure control or other applications, for example. The PID controller can be switched on and off.

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4 Technical data

4.1 Markings

4.1.1 Basic device

Mark	Definition
CE	The CE marking indicates compliance with the following European directives: • Low Voltage Directive 2014/35/EU[1)] • EMC Directive 2014/30/EU • Machinery Directive 2006/42/EC • Directive 2011/65/EU for limiting the use of certain hazardous substances in electrical and electronic equipment • Ecodesign Regulation 2019/1781
	The waste disposal of this product is performed in compliance with the WEEE Directive 2012/19/EU.
EAC	The EAC mark indicates compliance with the requirements of the technical regulations of the Customs Union (Eurasian Economic Union), Armenia, Belarus, Kazakhstan, Kyrgyzstan, and Russia.
	The RCM mark indicates compliance with the technical regulations of the Australian Communications and Media Authority (ACMA).
50	The China RoHS mark indicates compliance with the directive SJ/ T 11364-2014 regarding the restriction of use of certain hazardous substances in electrical and electronic equipment and its packaging.
	The NM mark states compliance with the following Moroccan directives[2)]: • Low Voltage Directive no. 2573-14 (July 16, 2015) • EMC Directive N° 2574-14 (July 16, 2015)
UA.TR. 013	The UA.TR mark declares conformity with the technical regulations of Ukraine.
	The KC mark declares compliance with §3 of Article 58-2 for the Korean Radio Wave Act.
UK CA	The UKCA mark indicates compliance with British directives (see UK declaration of conformity or UK declaration of incorporation).
c UL us LISTED	The UL and cUL mark indicates the granting of UL approval. cUL is equal to approval according to CSA. The UL/cUL mark is currently in preparation.

1) For products with functional safety, the requirements from the Low Voltage Directive are fulfilled by the Machinery Directive.

2) The selectable approvals UKCA (Great Britain) and NM (Morocco) are mutually exclusive.

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4.1.2 Accessories

CNF.. line filter

Mark	Definition
CE	The CE mark states compliance with the following European directives: • Low Voltage Directive 2014/35/EU • Directive 2011/65/EU for limiting the use of certain hazardous substances in electrical and electronic equipment
	The waste disposal of this product is performed in compliance with the WEEE Directive 2012/19/EU.
EAC	The EAC mark indicates compliance with the requirements of the technical regulations of the Customs Union (Eurasian Economic Union), Armenia, Belarus, Kazakhstan, Kyrgyzstan, and Russia.
50	The China RoHS mark indicates compliance with the directive SJ/T 11364-2014 regarding the restriction of use of certain hazardous substances in electrical and electronic equipment and its packaging.
UKCA	The UKCA mark states the compliance with the following British guidelines: • Low Voltage Directive S. I. 2016/1101 • Directive S. I. 2012/3032 for limiting the use of certain hazardous substances in electrical and electronic equipment
c UL us LISTED	The UL and cUL mark indicates the granting of UL approval. cUL is equal to approval according to CSA. The UL/cUL mark is currently in preparation.

4.2 General technical data

Interference immunity	Meets EN 61800-3; 2nd environment
Interference emission	Limit class C3 according to EN 61800-3. The interference suppression level can be improved using appropriate measures. Refer to chapter "EMC-compliant installation according to EN 61800-3" (→ 🖹 67) for further information.
Ambient temperature ϑ_{amb}	-10 – 40 °C without derating 40 – 55 °C with derating For further information, refer to chapter "Project planning" > "Selection of an inverter" > "Power reducing factors" (→ 🖹 65).
Type of cooling	Natural convection: • MCB91A-0025-5D3.. • MCB91A-0034-2D1.. Forced convection by means of a temperature-controlled fan: • MCB91A-0040-5D3.. • MCB91A-0042-2D1..

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Short-circuit current	The uninfluenced short-circuit current according to EN 61800-5-1 is 65 kA.
Degree of protection	IP20 in accordance with EN 60529, only with power connectors plugged in for grid and motor
Pollution class	2 in accordance with IEC 60664-1
Overvoltage category	III in accordance with IEC 60664-1
Installation altitude above sea level:	No restrictions apply to altitudes ≤ 1000 m. The following restrictions apply to altitudes > 1000 m: • From 1000 m to max. 3800 m: I_N reduction by 1% per 100 m • From 2000 m to max. 3800 m: To maintain protective separation and the air gaps and creepage distances according to EN 61800-5-1, an overvoltage protection device must be connected upstream to reduce the overvoltages from category III to category II.

4.3 Environmental conditions

4.3.1 Climatic conditions

Extended storage	Weatherproof IEC 60721-3-1 class 1K21, non-condensing, no condensation Deviating from the standard: Temperature -25 °C – +70 °C[1)]
Transport	Weatherproof IEC 60721-3-2 class 2K11, non-condensing, no condensation Deviating from the standard: Temperature -25 °C – +70 °C[1)]
Operation	Stationary use, weatherproof IEC 60721-3-3; class 3K22, non-condensing, no condensation Deviating from the standard: Temperature 0 °C to +40 °C

1) Depending on the configuration.

4.3.2 Special climatic conditions

Extended storage	Weatherproof IEC 60721-3-1 class 1Z1
Operation	Stationary use, weatherproof IEC 60721-3-3 class 3Z1

4.3.3 Biological conditions

Extended storage	Weatherproof IEC 60721-3-1 class 1B1
Transport	Weatherproof IEC 60721-3-2 class 2B1
Operation	Stationary use, weatherproof IEC 60721-3-3 class 3B1

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4.3.4 Chemically active substances

Extended storage	Weatherproof IEC 60721-3-1 class 1C2 Deviating from the standard: no corrosive gases, no salt mist
Transport	Weatherproof IEC 60721-3-2 class 2C2, no sea water Deviating from the standard: no corrosive gases, no salt mist
Operation	Stationary use, weatherproof ISO 9223 class C3 Deviating from the standard: no corrosive gases, no salt mist

4.3.5 Mechanically active substances

Extended storage	Weatherproof IEC 60721-3-1 class 1S10, no conductive dust
Transport	Weatherproof IEC 60721-3-2 class 2S1, no conductive dust
Operation	Stationary use, weatherproof IEC 60721-3-3 class 3S5, no conductive dust

4.3.6 Mechanical requirements

The specifications are characteristic values for the device test. The specifications are based on the test characteristic values according to IEC 60721-3-3 and correspond to class 3M5 according to EN 60721-3-3:1995.

The tests carried out in this context are time-limited vibration cycles.

Vibration (sinusoidal)	2 – 200 Hz: 1 g
Vibration (noise)	10 – 200 Hz: 0.3 m^2/s^3 200 – 500 Hz: 0.1 m^2/s^3 Corresponds to approx. 0.95 g_{rms} (g_{rms} = r.m.s. acceleration value)
Shocks (half sine)	10 g at 11 ms shock duration

4.4 Technical data of the MCB91A.. basic device 3 × AC 200 – 500 V

All technical data refers to a nominal line voltage of AC 400 V.

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4.4.1 Input

	Unit	MCB91A-....-5D3-2..	
Size		**0XS**	
Type		**0025**	**0040**
Nominal line voltage V_{line} (in accordance with EN 50160)	V	3 × AC 200 – 500	
Nominal line current AC I_{line}	A	2.25	3.6
Line frequency f_{line}	Hz	50 – 60 ± 5%	
Controlled rectifier	–	No	
Connection contacts X1	–	"Connector " (→ 🗎 102)	

4.4.2 Output

	Unit	MCB91A-....-5D3-2..	
Size		**0XS**	
Type		**0025**	**0040**
Output voltage V_A	V	0 – V_{line} [1)]	
Motor power ASM P_{Mot}	kW	0.75	1.5
Nominal output current I_N at the smallest possible PWM frequency	A	2.5	4
Overload capacity	–	150% × I_N for 30 s at f_{PWM} = 4 kHz	150% × I_N for 15 s at f_{PWM} = 4 kHz
Continuous output current at f = 0 Hz	–	75% × I_N at f_{PWM} = 4 kHz	
Apparent output power S_N	kVA	1.7	2.7
Nominal DC link voltage V_{DCL_nom}	V	DC 560 at V_{line} = 400 V	
Maximum DC link voltage V_{DCL_max}	V	DC 980	
PWM frequency f_{PWM}	kHz	4, 8, 16 (adjustable)	
Maximum output frequency f_{max}	Hz	LVFC: 500	
X2 connection contacts	–	"Connector " (→ 🗎 102)	

1) In inverter operation, it is technically impossible to provide the full line voltage (with direct power supply) at the output. The output voltage is generated from the DC link circuit and depends, among other things, on the level of its voltage, the control mode, and the operating point. Typically, the maximum output voltage in motor operation is approx. 8% below the line voltage.

4.4.3 General

	Unit	MCB91A-....-5D3-2..	
Size		**0XS**	
Type		**0025**	**0040**
Power section nominal power loss[1)]	W	25	38
Power consumption 24 V	W	1	
Interference suppression	–	EMC filter limit value category C3 in accordance with EN 61800-3	

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	Unit	MCB91A-....-5D3-2..	
Size		**0XS**	
Type		**0025**	**0040**
PE connection	–	M4 screw	
Permitted number of times power may be switched on/off per minute	min^{-1}	1	
Minimum switch-off time for power off	s	10	
Mass	kg	1.25	

1) To calculate the thermal power loss, add the values of "24 V power consumption" and "Nominal power loss of the power section".

4.5 Technical data of the MCB91A.. basic device 1 × AC 200 – 240 V

All technical data refers to a nominal line voltage of AC 230 V.

4.5.1 Input

	Unit	MCB91A-....-2D1-2..	
Size		**0XS**	
Type		**0034**	**0042**
Nominal line voltage V_{line} (in accordance with EN 50160)	V	1 × AC 200 – 240	
Nominal line current AC I_{line}	A	8.5	9.9
Line frequency f_{line}	Hz	50 – 60 ± 5%	
Controlled rectifier	–	No	
Connection contacts X1	–	"Connector " (→ 🗎 102)	

4.5.2 Output

	Unit	MCB91A-....-2D1-2..	
Size		**0XS**	
Type		**0034**	**0042**
Output voltage V_A	V	0 – V_{line} [1)]	
Motor power ASM P_{Mot}	kW	0.55	0.75
Nominal output current I_N at the smallest possible PWM frequency	A	3.4	4.2
Overload capacity	–	150% × I_N for 30 s at f_{PWM} = 4 kHz	150% × I_N for 15 s at f_{PWM} = 4 kHz
Continuous output current at f = 0 Hz	A	75% × I_N at f_{PWM} = 4 kHz	
Apparent output power S_N	kVA	1.35	1.7
Nominal DC link voltage V_{DCL_nom}	V	DC 326 at V_{line} = 230 V	
Maximum DC link voltage V_{DCL_max}	V	DC 420	

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	Unit	MCB91A-....-2D1-2..	
Size		**0XS**	
Type		**0034**	**0042**
PWM frequency f_{PWM}	kHz	4, 8, 16 (adjustable)	
Maximum output frequency f_{max}	Hz	LVFC: 500	
X2 connection contacts	–	"Connector " (→ 🗎 102)	

1) In inverter operation, it is technically impossible to provide the full line voltage (with direct power supply) at the output. The output voltage is generated from the DC link circuit and depends, among other things, on the level of its voltage, the control mode, and the operating point. Typically, the maximum output voltage in motor operation is approx. 8% below the line voltage.

4.5.3 General

	Unit	MCB91A-....-2D1-2..	
Size		**0XS**	
Type		**0034**	**0042**
Power section nominal power loss[1)]	W	50	60
Power consumption 24 V	W	1	
Interference suppression	–	EMC filter limit value category C3 in accordance with EN 61800-3	
PE connection	–	M4 screw	
Permitted number of times power may be switched on/off per minute	min^{-1}	0.5	
Minimum switch-off time for power off	s	30	
Mass	kg	1.28	

1) To calculate the thermal power loss, add the values of "24 V power consumption" and "Nominal power loss of the power section".

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4.6 Electronics data

If inductive loads are connected to outputs, you must install an external protective element (freewheeling diode).

4.6.1 X20: Digital inputs

	Specification
Quantity	4
Design	Type 2 according to IEC 61131-2
Cycle time	2 ms
Response time	175 µs plus cycle time
Connection	X20:1 – 4: Digital inputs DI01 – DI04: Selectable, see parameter menu, current consumption per digital input 6 mA X20:5: VO24: DC 24 V voltage output I_{max} = 50 mA X20:6: GND: Reference potential
Connection contacts	"Cage clamp terminal" (→ 🗎 102)
Maximum cable length	30 m

4.6.2 X20: Digital input or digital output DIO01 – DIO02

	Specification
Quantity	2
Design	Type 2 according to IEC 61131-2
Cycle time	2 ms
Response time	175 µs plus cycle time
Maximum output current	50 mA
Short-circuit protection	Yes
Connection	X20:7– 8: DIO01 – DIO02: Selectable, see parameter menu as digital input: Current consumption per digital input 6 mA as digital output: Permanently short-circuit proof and protected against external voltage up to 30 V Total current (both as digital outputs): 50 mA X20:9: TF1: Sensor input for temperature sensor X20:10: GND: Reference potential
Connection contacts	"Cage clamp terminal" (→ 🗎 102)
Maximum cable length	30 m

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4.6.3 X20: Sensor input for temperature evaluation of the TF1 motor

	Specification
Quantity	1
Temperature sensors with evaluation capability	PTC thermistor (TF) Bimetallic temperature switch (TH)
Response threshold TF	1830 Ω
Connection	X20:9: TF1 X20:10: GND
Connection contacts	"Cage clamp terminal" (→ 🗎 102)

4.6.4 X23: Analog input AI1 and analog input/analog output AIO1

	Specification
Quantity	2 (1 input and 1 input/output)
Cycle time	2 ms
Response time	175 µs plus cycle time
Current output	I_{max} = 50 mA
Resolution	10 bits
Short-circuit protection	Yes
Connection	X23:1: REF reference voltage output: 10 V, I_{max} = 3 mA X23:2: Analog input AI1: Voltage input 0 – 10 V Input resistance R_i ≥ 20 kΩ Current input 0 (4) – 20 mA Input resistance R_i = 250 Ω The input is referenced to GND, analog input voltage or current, switchable via DIP switch S4. X23:3: GND: Reference potential X23:4: AIO1 Analog input or analog output AIO1 parameterizable: • AIO1 as analog input: 0 – 10 V, input resistance R_i ≥ 20 kΩ • AIO1 as analog output: 0 – 10 V, load resistance R_{Last} ≥ 10 kΩ I_{max} = 1 mA
Connection contacts	"Cage clamp terminal" (→ 🗎 102)
Maximum cable length	30 m

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4.6.5 X22: Relay output DOR

	Specification
Quantity	1
Current-carrying capacity of relay contacts	V_{max} = DC 30 V, I_{max} = DC 0.8 A
Connection	X22:1: DOR-C, shared relay contact X22:2: DOR-NO, NO contact X22:3: DOR-NC, NC contact Selectable, see parameter menu
Connection contacts	"Cage clamp terminal" (→ 🗎 102)
Maximum cable length	30 m

4.7 CFX11A-E gateway for EtherNet/IP™ and Modbus TCP

4.7.1 Information

INFORMATION

The gateway for EtherNet/IP™ and Modbus TCP is available as an option.

INFORMATION

Only MOVITRAC® basic inverters with a delivery date from 07.04.2025 onwards are compatible with the CFX11A.. gateways and the CFC11A communication module.

4.7.2 Description

The gateway makes it possible to connect the inverter to EtherNet/IP™- or Modbus TCP-based higher-level automation, project planning, and visualization systems. The gateway has the following characteristics:

- EtherNet/IP™ or Modbus TCP
- Media redundancy
- Integrated switch with cut-through procedure

When using the gateway, you can communicate directly with the devices via Ethernet and use the MOVISUITE® engineering software for startup, diagnostics, and parameterization purposes.

Seven additional inverters can be connected to the gateway using the CFC11A communication module.

Only the CBG21A keypad can be used with the gateway (prerequisite: Keypad firmware FW7.00).

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4.7.3 Technical data

CFX11A-E gateway for EtherNet/IP™ and Modbus TCP	
Ambient temperature	-10 – 55 °C[1)]
Application protocols	EtherNet/IP™, Modbus TCP, HTTP, SNMP, DHCP, SEW Application Services
Degree of protection	IP20 in accordance with EN 60529
Power consumption	3 W
Network protocols	ARP
Media redundancy (DLR)	Yes
Baud rate	100 Mbaud/10 Mbaud, full duplex/half duplex
Connection technology	2 × RJ45
Ethernet switch	Integrated
Ethernet switch switching technology	Cut through
Ethernet switch latency period	5.5 µs
Manufacturer ID	$013B_{hex}$ (EtherNet/IP™)
EDS file name	SEW MOVI-C MOVITRAC Gateway CFX.eds
Port numbers used	Port overview, see Online Support
Purchase order number	28315049
Dimensions in mm (W × H × D)	53 × 158 × 39

1) At clock frequency of basic device > 4 kHz: -10 – 50 °C.

4.8 CFX11A-N gateway for PROFINET

4.8.1 Information

INFORMATION

The CFX11A-N gateway for PROFINET is available as an option.

INFORMATION

Only MOVITRAC® basic inverters with a delivery date from 07.04.2025 onwards are compatible with the CFX11A.. gateways and the CFC11A communication module.

4.8.2 Description

The gateway makes it possible to connect the inverter to PROFINET-based, higher-level automation, project planning, and visualization systems.

When using the gateway, you can communicate directly with the devices via Ethernet and use the MOVISUITE® engineering software for startup, diagnostics, and parameterization purposes.

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Seven additional inverters can be connected to the gateway using the CFC11A communication module.

Only the CBG21A keypad can be used with the gateway (prerequisite: Keypad firmware FW7.00).

4.8.3 Technical data

CFX11A-N gateway for PROFINET	
Ambient temperature	-10 – 55 °C[1)]
PROFINET	RT, IRT[2)] (Isochronous Realtime)
Degree of protection	IP20 in accordance with EN 60529
Power consumption	3 W
Conformance class	C
Netload class	3
Topology detection (LLDP)	Yes
Automatic addressing (LLDP, DCP)	Yes
Media redundancy (MRP)	Yes
I&M data	I&M0 – I&M5
Manufacturer ID	$010A_{hex}$
Baud rate	100 MBaud, full duplex
Connection technology	2 × RJ45
Ethernet switch	Integrated
Ethernet switch switching technology	Cut through
Ethernet switch latency period	5.5 µs
EtherType 8892_{hex}	PROFINET
EtherType 88B5	Address Editor from SEW-EURODRIVE
GSD file name	GSDML-V2.43-SEW-MOVI-C-MOVITRAC-gateway-20240411-074616
SEW engineering (firmware update, diagnostics)	Yes
Port numbers used	Port overview, see Online Support
Purchase order number	28315022
Dimensions in mm (W × H × D)	53 × 158 × 39

1) At clock frequency of basic device > 4 kHz: -10 – 50 °C.

2) IRT up to gateway, no forwarding to lower-level axes with communication module.

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4.9 CFX11A-S gateway for EtherCAT®/SBus^{PLUS} (in preparation)

4.9.1 Information

INFORMATION

CFX11A-S gateway for EtherCAT®/SBus^{PLUS} is available as an option.

INFORMATION

Only MOVITRAC® basic inverters with a delivery date from 07.04.2025 onwards are compatible with the CFX11A.. gateways and the CFC11A communication module.

4.9.2 Description

The CFX11A-S gateway establishes a powerful EtherCAT®/SBus^{PLUS} connection to MOVI-C® CONTROLLERs. EtherCAT® stations from SEW-EURODRIVE or other manufacturers can now be controlled and diagnosed by a MOVI-C® CONTROLLER.

The functions of the MOVI-C® CONTROLLER are:

- Freely programmable sequence control according to IEC 61131 for automating drive and logic tasks
- Central data storage for all inverters of the MOVI-C® modular automation system from SEW-EURODRIVE on EtherCAT®/SBus^{PLUS}
- Plug-and-play device replacement through automatic data recovery
- Central setpoint input
- EtherCAT®/SBus^{PLUS} master for SEW-EURODRIVE components and for peripheral devices with EtherCAT® interface
- Fieldbus device interface to higher-level control systems
- Diagnostics and visualization of the automation system

Seven additional inverters can be connected to the gateway using the CFC11A communication module.

Only the CBG21A keypad can be used with the gateway.

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4.9.3 Technical data

CFX11A-S gateway for EtherCAT®/SBus^{PLUS}	
Ambient temperature	-10 – 55 °C[1)]
Power consumption	2 W
Degree of protection	IP20 in accordance with EN 60529
Automatic baud rate detection	Yes, full duplex
Supported baud rate	100 MBaud
Connection technology	2 × RJ45
Product code	B_{hex}
Manufacturer ID	59_{hex}
Device family	MOVI-C®
Application protocols	EtherCAT®, SdO, FoE
Permitted cable types	Category 5 and higher, class D according to IEC 11801
Maximum cable length	100 m
Purchase order number	28315030
Dimensions in mm (W × H × D)	53 × 158 × 39

1) At clock frequency of basic device > 4 kHz: -10 – 50 °C.

4.10 CFC11A communication module

4.10.1 Information

INFORMATION

The CFC11A communication module is available as an option.

INFORMATION

Only MOVITRAC® basic inverters with a delivery date from 07.04.2025 onwards are compatible with the CFX11A.. gateways and the CFC11A communication module.

4.10.2 Description

The CFC11A communication module forms the extended communication connection of up to 7 additional inverters for the CFX11A-E, CFX11A-N, and CFX11A-S gateways. No keypads can be used with the CFC11A communication module. Operation and engineering are performed via the gateway.

The communication connection between the gateway and all other communication modules is established via a ribbon cable, which is included with the CFC11A communication module.

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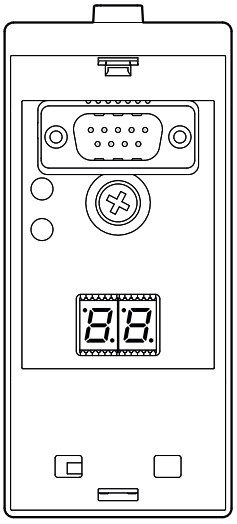
4.10.3 Technical data

CFC11A communication module	
Ambient temperature	-10 – 60 °C
Degree of protection	IP20 in accordance with EN 60529
Power consumption	0.4 W
Purchase order number	28315138
Dimensions in mm (W × H × D)	45 × 100 × 20

4.11 CDM11A diagnostic module

4.11.1 Description

The CDM11A diagnostic module is the interface to the MOVISUITE® engineering software. The module contains two 7-segment displays for displaying the device status. The module is required to use the CBG11A, CBG21A, and CBG22A keypads.



CDM11A properties:

- 2-digit 7-segment display
- Output of fault codes and status
- Engineering interface

4.11.2 Technical data

INFORMATION

The CDM11A diagnostic module can only be plugged directly onto the inverter.

CDM11A diagnostic module	
Power consumption	0.25 W
Dimensions in mm (W × H × D)	46 × 100 × 20
Screen type	2-digit 7-segment display
Engineering interface	D-sub, 9-pin
Part number	28265092

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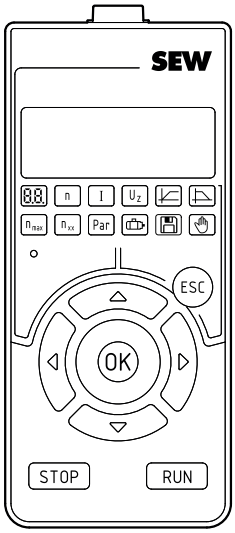
4.12 CBG01A keypad

4.12.1 Description

The CBG01A keypad enables operation, parameterization, and output of fault codes for the inverters. The keypad is connected directly to the basic device.



CBG01A properties:

- 5-digit 7-segment display
- Output of fault codes, status and operating state
- Startup of asynchronous motors:
  - with or without brake (firmware-dependent)
  - with or without temperature sensors (depending on firmware)
  - without encoder
- Simple diagnostics
- Saving and copying a parameter set
- Language: none (7-segment display)

For more information, refer to the "Keypad CBG01A" manual.

4.12.2 Technical data

CBG01A keypad	
Ambient temperature	0 to 60 °C
Degree of protection	IP40 in accordance with EN 60529
Power consumption	0.25 W
Dimensions in mm (W × H × D)	45 × 100 × 19
Screen type	5-digit 7-segment display
Part number	28269993

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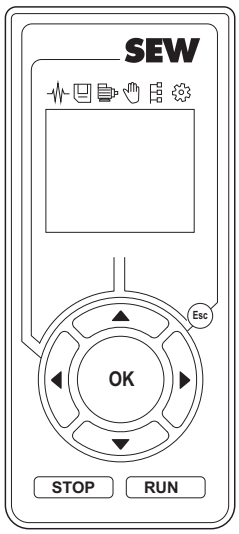
4.13 CBG11A keypad

4.13.1 Description

The keypad enables convenient startup, operation, parameterization, and diagnostics of inverters of the MOVI-C® modular automation system due to the full-text display.

The keypad has a mini USB interface with gateway function. A connection from the inverter to a PC can be established using this interface for engineering with MOVISUITE®.



CBG11A properties:

- 38 mm monochrome display (1.5")
- Startup of asynchronous motors:
  - with or without brake
  - with or without temperature sensors
  - without encoder
- Diagnostics
- Saving and copying a parameter set
- Firmware update of the inverter via USB connection
- Connection to MOVISUITE® engineering software via keypad
- Determination of load moment of inertia
- Access to all parameters
- Language: EN
- Door mounting frame COG11A available

The CDM11A diagnostic module is required to plug the keypad directly onto the inverter.

A COG11A door mounting frame is available for using the keypad remotely on a control panel or control cabinet door. In this case, the UKS52A cable is also required.

4.13.2 Technical data

CBG11A keypad	
Part number	28233646
Ambient temperature	0 – 60 °C
Degree of protection	IP40 according to EN 60529
Power consumption	0.6 W
Dimensions in mm (W × H × D)	45 × 100 × 20
Display dimensions in mm (W × H)	28.5 × 23
Diagonal screen measurement	38 mm (1.5")
Screen resolution in pixels (W × H)	78 × 64
Screen type	Monochrome display
Engineering interface	USB 2.0 mini B, female
Connection interface	D-sub 9-pin, female

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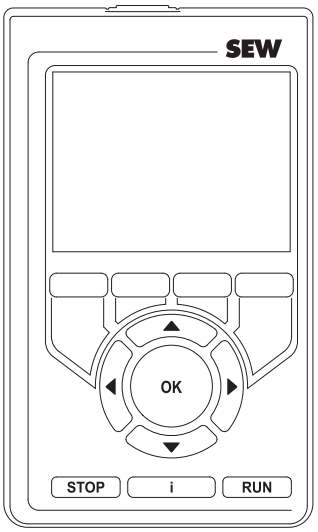
CBG11A keypad	
Mechanical strength	3M5 according to DIN EN 60721-3-3: 1995 5M1 according to DIN EN 60721-3-5: 1997

4.14 CBG21A keypad

4.14.1 Description

The keypad enables convenient startup, operation, parameterization, and diagnostics of inverters of the MOVI-C® modular automation system due to the full-text display.

The keypad has a mini USB interface with gateway function. A connection from the inverter to a PC can be established using this interface for engineering with MOVISUITE®.



CBG21A properties:

- 61 mm color display (2.4")
- Startup of asynchronous and synchronous motors:
  - with or without brake
  - with or without temperature sensors
  - with or without encoder
- Diagnostics
- Saving and copying several parameter sets
- Firmware update of the inverter via USB connection
- Connection to MOVISUITE® engineering software via keypad
- Determination of load moment of inertia
- Optimization of the drive train in terms of clearance and stiffness
- Access to all parameters
- Languages: DE/EN/FR/IT/ES/KO/PT/HU/ZH/RU
- Door mounting frame COG11A available

The CDM11A diagnostic module is required to plug the keypad directly onto the inverter.

A COG11A door mounting frame is available for using the keypad remotely on a control panel or control cabinet door. In this case, the UKS22A cable is also required.

4.14.2 Technical data

CBG21A keypad	
Part number	28238133
Ambient temperature	-10 – 60 °C
Degree of protection	IP40 in accordance with EN 60529
Power consumption	1.4 W

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CBG21A keypad	
Dimensions in mm (W × H × D)	65 × 110 × 20
Display dimensions in mm (W × H)	49 × 37
Diagonal screen measurement	61 mm (2.4")
Screen resolution in pixels (W × H)	320 × 240
Screen type	Color display
Engineering interface	USB 2.0 mini B, female
Connection interface	D-sub 9-pin, female
Mechanical strength	3M5 according to DIN EN 60721-3-3: 1995 5M1 according to DIN EN 60721-3-5: 1997
Internal memory	128 MB (sufficient for several hundred data sets) The memory can also be used for images, documents, projects, etc.

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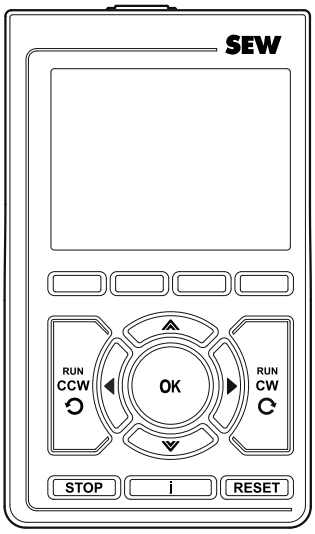
4.15 CBG22A local keypad

4.15.1 Description

The full-text display of the local keypad enables a convenient display of customer-specific information texts of the higher-level controller. It also enables the operator to perform diagnostics and manual operation.

The local keypad has a mini USB interface with gateway function. A connection from the inverter to a PC can be established using this interface for engineering with MOVISUITE®.



CBG22A properties:

- 61 mm color display (2.4")
- Display of customer-specific information texts of the higher-level controller, diagnostics and manual mode by the operator
- Simple and intuitive manual mode[1)] for continued operation in the event of a system failure
- Comprehensive diagnostics methods
- Exclusively read-only access to parameters in order to protect against incorrect use
- Optional access to functions and states of the control elements and data transfer for Ethernet-based communication methods of the drive systems
- Connection to MOVISUITE® engineering software via keypad
- COG11A door mounting frame available
- Languages: DE, EN, FR, ES, PT, ZH, RU

1) Only in combination with devices with key switch

The CDM11A diagnostic module is required to plug the keypad directly onto the inverter.

The CBG22A local keypad can either be plugged directly onto the inverter or used remotely. The COG11A door mounting frame is available for using the keypad remotely on a control panel or control cabinet door. In this case, the UKS52A cable is also required. If the CBG22A local keypad is plugged directly onto the inverter, manual mode cannot be used.

4.15.2 Technical data

CBG22A local keypad	
Part number	28277554
Ambient temperature	-10 – 60 °C
Degree of protection	IP40 in accordance with EN 60529
Power consumption	1.4 W
Dimensions in mm (W × H × D)	65 × 110 × 20
Display dimensions in mm (W × H)	49 × 37
Diagonal screen measurement	61 mm (2.4")
Screen resolution in pixels (W × H)	320 × 240

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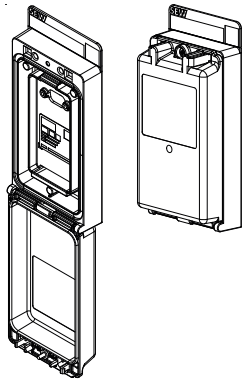
CBG22A local keypad	
Screen type	Color display
Engineering interface	USB 2.0 mini B, female
Connection interface	D-sub 9-pin, female
Mechanical strength	3M5 according to DIN EN 60721-3-3: 1995 5M1 according to DIN EN 60721-3-5: 1997

4.16 COG11A door mounting frame

4.16.1 Description



The COG11A door mounting frame allows the CBG11A, CBG21A, and CBG22A keypads to be used remotely from the inverter, e.g. on the control cabinet door or an operating panel.

The UKS22A and UKS52A prefabricated cables are required for the connection between the COG11A and the inverter and must be ordered separately.

4.16.2 Technical data

Door mounting frame COG11A	
Part number	28265688
Purpose of use	Door mounting frame for the following keypads: • CBG11A, part number 28233646 • CBG21A, part number 28238133 • CBG22A, part number 28277554
Scope of delivery	• COG11A (door mounting frame with cover) • Seal • Drilling template • 3 screws Ø 4 mm × 16 mm
Connection	D-sub connector, 9-pin, female
Protection class	IP65 with tightening torque of 1.2 – 1.4 Nm for the cover screw Enclosure UL Type I

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Door mounting frame COG11A	
Dimensions in mm (H × W × D)	• Closed: 169 × 79.6 × 42 • Open: 315 × 79.6 × 29
Maximum metal thickness of the control cabinet door	7 mm
Space required to open the cover	200 mm

For further information, refer to the installation instructions "Door mounting frame COG11A".

Prefabricated cables

Only use cables provided by SEW-EURODRIVE. Use the UKS22A cable for the CBG11A and CBG21A keypads. The UKS52A cable also has a contact for a switch or key switch. As long as this contact is not closed, the inverter cannot be operated in manual mode with the CBG22A keypad. This allows the CBG22A keypad to be locked against unauthorized access.

Length	Part number	Type
5 m	25721763	UKS22A
Variable, 1 – 10 m[1)]	28149963	UKS52A[2)]
2 m	28152751	
5 m	28152646	
10 m	28156870	

1) In 1 m increments.

2) A port saver is required for this cable type. This is included in the scope of delivery.

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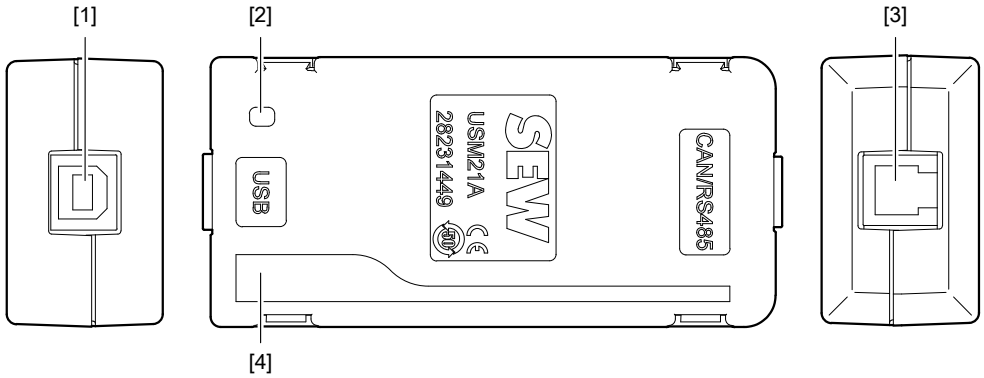
4.17 USM21A interface adapter

4.17.1 Description

The USM21A interface adapter is used to connect a PC to the X32 service interface of the CDM11A diagnostic module on the inverter.

The following figure shows the USM21A interface adapter:



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[1] USB socket type B
[2] Bus status display
[3] RJ10 socket
[4] Interface adapter status display

4.17.2 Technical data

USM21A interface adapter	
Part number	28231449
Interference immunity	Complies with EN 61800-3
Ambient temperature	0 – 40 °C
Storage temperature	-25 – 70 °C according to EN 60721-3-3, class 3K3
Degree of protection	IP20 in accordance with EN 60529
Interfaces	RJ10 socket (device connection) USB socket type B (PC connection)
Mass	200 g
Dimensions in mm (L × W × H)	92.5 × 43 × 25

An order using part number 28231449 includes the following parts:

- USM21A interface adapter
- USB connection cable for the USM21A – PC connection
- Serial interface cable with 2 RJ10 connectors

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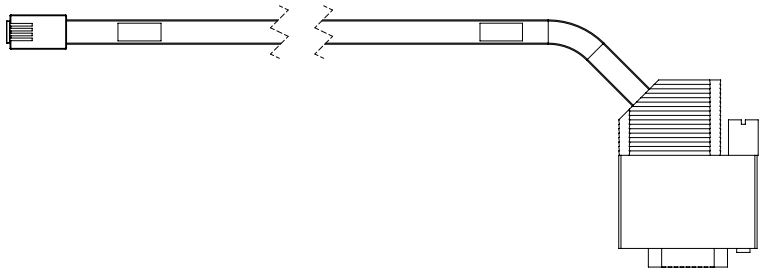
INFORMATION

To connect the inverter to the USM21A, you need an additional serial interface cable with an RJ10 connector and a 9-pin D-sub connector, part number 18123864.

This cable must be ordered separately.



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The CDM11A diagnostic module is required to connect the inverter to the USM21A interface adapter.

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4.18 CNF.. line filter

4.18.1 Description

CNF.. line filters are used to suppress electromagnetic interference between the supply system and the inverter. Line filters are required in order to comply with the interference emissions of limit class C2 according to EN 61800-3.

INFORMATION

Do not switch between the CNF.. line filter and inverter.

4.18.2 Technical data

Line filter	Unit	CNF11A	CNF31A
Part number	–	28296311	28296354
Nominal line voltage V_{line} (in accordance with EN 50160)	V	1 × AC 200 – 240 V	3 × AC 200 – 500 V
Line frequency f_{line}	Hz	50 – 60 ± 5%	
Nominal current I_N	A	10	3.6
Nominal power loss	W	4.5	2.5
Ambient temperature ϑ_A	°C	0 – 55 °C	
Derating at ambient temperature > 45 °C	–	-3% I_N/K up to maximum 60 °C	
Connection contact L1/L2/L3 – L1'/L2'/L3'	–	Connector: - 1 conductor: 0.25 – 2.5 mm² - 2 conductors: 0.25 – 1.0 mm² (twin AEH)[1)]	
Cross section L1/L2/L3 – L1'/L2'/L3'	mm²	2.5	
Tightening torque L1/L2/L3 - L1'/L2'/L3'	Nm	0.5 – 0.6	
PE connection contact	–	M4 screw	
Tightening torque PE	Nm	1.2 – 1.5	
Degree of protection	–	IP20	
Mass	kg	0.33	0.34

1) AEH: Wire ferrule

4.18.3 Assignment to inverter

Line filter	CNF11A	CNF31A
MCB91A-....-5D3..	–	0025 0040
MCB91A-....-2D1..	0034 0042	–

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4.18.4 Dimension drawings and dimensions

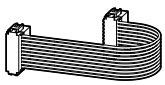
For a dimension sheet and the dimensions of the line filter, refer to chapter "Dimension drawings" (→ 🗎 56).

4.19 Standard accessories

Inverter	Contents	Quantity	Scope of delivery	Part number accessory pack
MCB91A.. 3-phase	Shield plate for motor cable, shield plate for control cable, power plug and motor connector, insulating disk for converting to IT system operation	1	Included in the scope of delivery	28296370
MCB91A.. 1-phase	Shield plate for motor cable, shield plate for control cable, power plug and motor connector, insulating disk for converting to IT system operation	1	Included in the scope of delivery	28289552

4.20 Connectors and connections

The following list is used for re-ordering connectors:

Representation	Slot	Function	Size	Part number
	X1	Line connection	MCB91A-.... -5D3..	13289780
	X1	Line connection	MCB91A-.... -2D1..	13289772
	X2	Motor connection	All	17975239
	X5	DC 24 V supply voltage	Gateway	19148410
	X34 IN/OUT	Ribbon cable for connecting the gateway with the communication module	Communication module	28174631

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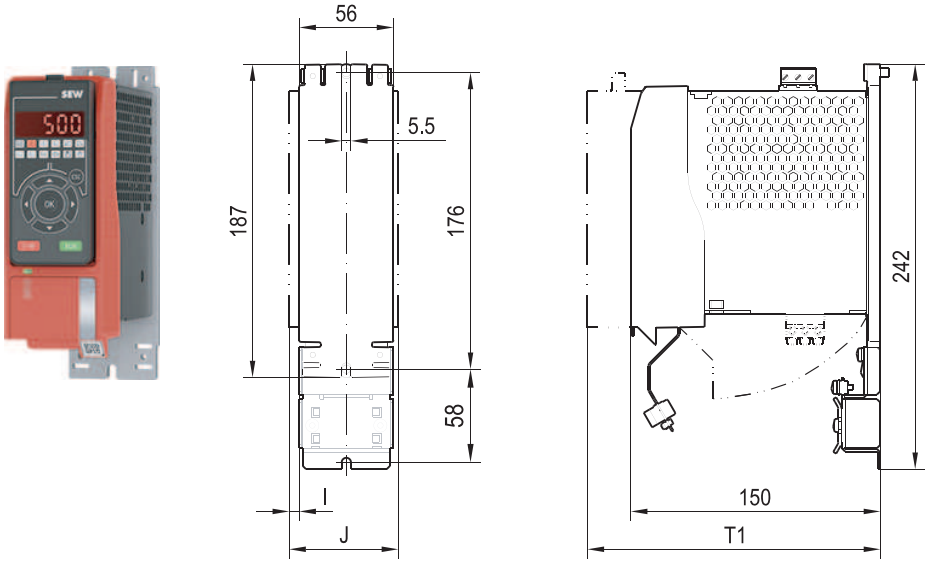
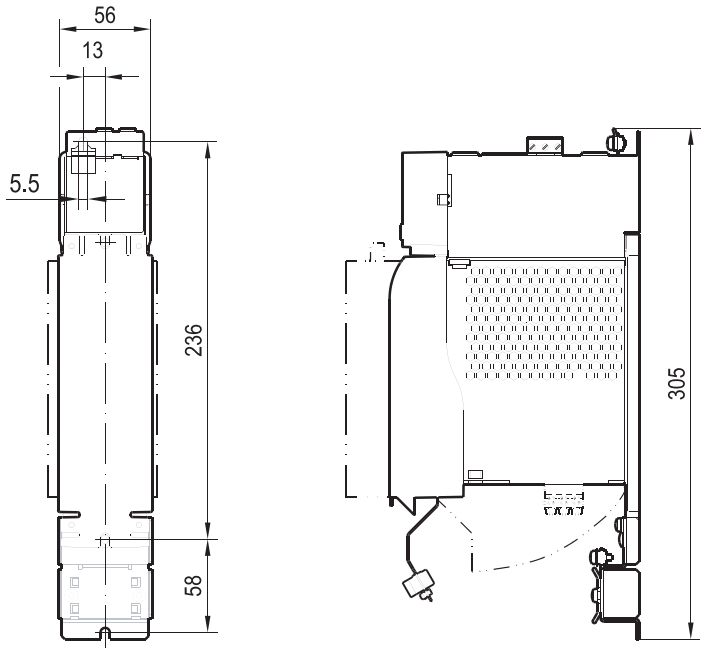
4.21 Dimension drawings

4.21.1 MCB91A-0025-5D3-2.., MCB91A-0040-5D3-2.., MCB91A-0034-2D1-2.., MCB91A-0042-2D1-2..



	CBG01A	CDM11A	CDM11A+CBG11A	CDM11A+CBG21A	CFC11A	CFX11A-..
I	-	-	-	6	-	-
J	-	-	-	65	-	-
T1	156	157	175	175	160	175

CNF11A
CNF31A



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5 Project planning

5.1 SEW-Workbench

The SEW-Workbench is the central configuration software for inverters from SEW-EURODRIVE.

It can process any required configurations, from entering the application to gear unit, motor and inverter calculations. Optimization of the various axis cycles including accessory selection and error check of the entire drive system design are further features.

Of course, the Workbench can also be used to select and dimension all other products from SEW-EURODRIVE, such as decentralized drives and gearmotors. This means SEW-Workbench allows for dimensioning drive solutions from the entire product range from SEW-EURODRIVE. The straightforward operation saves a great deal of time and minimizes complexity.

The key features of the SEW-Workbench are:

- Application selection
- Gear unit and motor calculation
- Price-optimized configuration
- Comparison of different solutions
- Inverter calculation
- Multi-axis optimization
- Parameterization of cable and accessories selection
- Dimensioning error check
- Parts list generation
- The electronic catalog with all products

The SEW-Workbench configuration software is available for download from the official SEW-EURODRIVE website.

To use SEW-Workbench, all you need to do is to register via the Online Support once you have downloaded and installed the software or received the data DVD. An Internet update service ensures that the products and functions are always up-to-date.

5.2 Schematic workflow for project planning

The following flow diagram illustrates the project planning procedure for drive selection. The drive consists of a gearmotor that is supplied by an inverter.

Required information about the machine to be driven
- Technical data and ambient conditions
- Speed setting range
- Calculating the travel cycle

↓

Calculation of relevant application data
- Travel diagram
- Rotational speeds
- Static, dynamic torques
- Regenerative power

↓

Gear unit selection
- Define the gear unit size, gear unit ratio, and gear unit design
- Check the gear unit load
- Check the input speed

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↓

Motor selection
- Maximum torque
- With dynamic drives: effective torque at medium speed
- Maximum speed
- Observe dynamic and thermal torque curves
- Motor equipment (brake, plug connector, thermal motor protection, etc.)

↓

Inverter selection
- Selection of communication
- Motor/inverter assignment
- Check whether the inverters fulfill the duration and overload requirements

↓

Select other system components
- Motor and supply system cables
- Signal cable
- EMC accessories

↓

Selecting the 24 V voltage supply
- Determine the current demand of the 24 V voltage supply
- Observe the requirements for the voltage tolerance

↓

Ensure that all requirements have been met.

5.3 Control mode

The characteristics of the motor connected to the inverter are influenced by the control modes used.

5.3.1 LVFC

The LVFC control mode is intended for easy open-loop operation of asynchronous motors without encoder feedback. The procedure operates an asynchronous machine on a parameterizable voltage/frequency characteristic. To keep the magnetizing current on a constant level, the voltage (V) is adjusted in proportion to the frequency (f).

The current slip is calculated and can be compensated.

The LVFC control mode is suitable for applications with a limited speed setting range, where no dynamic step changes in load occur and where there are small requirements regarding the control characteristics.

The LVFC control mode is suitable for group drives. A group drive is an electrical parallel connection of several identical or different motors at one inverter. The motors do not have a rigid mechanical connection.

Speed control

The LVFC control mode is an encoder-less mode and calculates the actual speed value.

The LVFC control mode does not have a higher-level speed controller, so speed controller parameterization is not possible. An acceleration and torque precontrol is not possible either.

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5.3.2 Characteristics of the control modes

Overview of the control mode

	LVFC
Principle	Voltage controlled according to characteristic curve
Motor	Asynchronous motor
Open-loop speed control	Yes
Typical applications	Simple speed applications

Recommended maximum output frequency

SEW-EURODRIVE recommends not exceeding the output frequency of $f_{PWM}/10$ for all control modes.

f_{PWM}	LVFC
4 kHz	400 Hz
≥ 8 kHz	500 Hz

5.4 Drive selection

5.4.1 General information

For drive selection, in addition to the travel diagram that describes the exact travel cycle, a large number of additional specifications must be made about the operating and ambient conditions.

It is first necessary to have data for the machine to be driven such as mass, setting range, information about the mechanical design and so on in order to select the drive correctly. The appropriate drive can be selected with the calculated torques and speeds of the drive while taking other mechanical requirements such as ambient and operating conditions into account.

Only an asynchronous motor can be used when selecting the drive. The extensive product range of SEW-EURODRIVE is available for this purpose.

5.4.2 General requirements for motors

The technical data of the motors must lie within the following ranges:

Nominal motor speed	0 – 40000 1/min
Nominal motor current	0 – 10000 A
Nominal motor voltage	0 – 2000 V
Nominal motor torque	0 – 50000 Nm
Rated motor frequency	0 – 600 Hz
Number of pole pairs	1 – 64

Motors that can be connected

Motors that can be connected include:

- Asynchronous motors with squirrel-cage rotor

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When third-party motors are operated with inverters, SEW-EURODRIVE cannot ensure that the specified performance data is reached.

Dielectric strength of the motor

The operation of an AC motor with a frequency inverter places a much greater load on the motor winding than in the case of operation on the supply system. All AC motors from SEW-EURODRIVE have the required voltage endurance.

The connected third-party motor has to be designed in inverter mode for these DC link voltages.

At a line voltage of AC 3 × 400 V, the nominal DC link voltage is DC 560 V. In regenerative operation, the DC link voltage can rise to higher values, see chapter "Technical data" (→ 🗎 30).

At a line voltage of AC 1 × 230 V, the nominal DC link voltage is DC 325 V. In regenerative operation, the DC link voltage can rise to higher values, see chapter "Technical data" (→ 🗎 30).

The inverters pulse the DC voltage of the DC link V_{DC} from the supply cable to the motor. At SEW-EURODRIVE, the pulsed voltage supply is available with 4 kHz, 8 kHz, or 16 kHz. As a result, the motor is loaded with voltage peaks, high amplitude and very short rise times.

For operation of third-party motors on inverters from SEW-EURODRIVE, their suitability must be checked.

Thermal motor protection

Thermal motor protection avoids overheating and, therefore, prevents irreparable damage to the motor. For this purpose, temperature sensors detect the winding temperature. As standard, the inverters can evaluate the following temperature sensors.

Motor protection	Number of sensors	SEW-EURODRIVE designation
PTC thermistor	3	TF
Bimetallic temperature switch	3	TH

Motor series	Temperature sensor	Motor protection
DR..	TF, TH	Comprehensive protection[1)]
Third-party motors	PTC thermistor, bimetallic temperature switch	Comprehensive protection[1)]

1) Comprehensive protection due to one sensor per motor phase.

For additional information on the thermal motor protection, refer to the documentation of the motors.

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5.4.3 Group drive and multi-motor drive

Group drive of asynchronous motors

A group drive is a group of asynchronous motors of any power rating. The motors do not have a rigid mechanical connection or only have a connection that is subject to slip and are connected to an electrically parallel inverter.

Operating a group drive is only possible in the LVFC operating mode.

Multi-motor drive of asynchronous motors

Multi-motor drive means the electrical parallel connection of several identical asynchronous motors at 1 inverter, that are rigidly and mechanically coupled and drive a load.

Parallel operation of several identical asynchronous motors is possible provided the strict compliance with the following conditions:

- Only use gearmotors of the same type and with the same winding data.
- The rotor position of the individual motors must not differ by more than the following mechanical angle:

  $Z_p \times \Delta\varphi_{mech\_max} < 20°$

  Z_p = Number of motor pole pairs

  $\Delta\varphi_{mech\_max}$ = Maximum torsion angle of the shaft connection in regard of the motor shaft

  This must be ensured by the mechanics, even for maximally different torque loads of the motor shafts.

The maximum number of motors depends on the control mode:

Control mode	Number of motors
LVFC	64

Temperature evaluation for group and multi-motor drives

Observe the following additional notes for group and multi-motor drives:

- Preferably use bimetallic temperature switches TH.
- The series connection of the TH contacts (normally closed) is not subject to any restriction if joint monitoring is provided.
- If the TF temperature sensors are available in motors, the temperature sensors of up to 3 motors can be connected in series.

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Permissible cable length for group and multi-motor drives

Note the permitted length of all motor cables connected in parallel:

$$l_{tot} \leq \frac{l_{max}}{n} \qquad l_{tot} = \sum_{i=1}^{n} l_i$$

l_{tot} = Maximum total length of motor cables connected in parallel

l_{max} = Permitted motor cable length

l_i = Cable length of the inverter to the motor

n = Number of motors connected in parallel

5.4.4 General requirements for brake control

Refer to the motor catalogs for extensive information and technical data regarding the brakes.

Brake control

Brakes are controlled via relay contact X22 on the inverter. It is not permitted to control them via other electronic devices or via controllers.

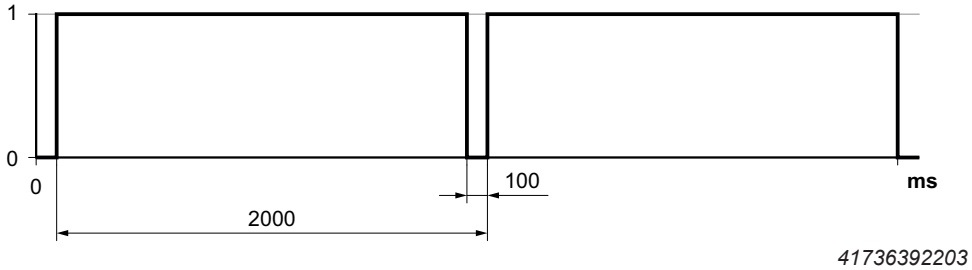
Upon of a motor with a brake, relay contact X22 (DOR-C; DOR-NO) is automatically parameterized to brake output and locked against subsequent manual changes if a motor with a brake in the drive train is configured. This functionality is supported with the MOVISUITE® engineering software or with the CBG11A or CBG21A keypads.

As a result, a power contactor with DC 24 V coil voltage or a suitable brake rectifier from SEW-EURODRIVE can be controlled directly. The brake is switched with this power contactor.

Direct switching of the brake via relay contact X22 (DOR-C, DOR-NO) is not permitted.

Permitted load of brake control and brake

One complete switching sequence (opening and closing) must not be repeated more often than a maximum of every 2 seconds. SEW-EURODRIVE brakes must remain closed for at least 100 ms before they are allowed to be applied again.



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5.4.5 Operation in noise-sensitive environments

Consider the following points to realize the quietest possible operation:

- Gearmotor (fan, gear ratio, oil, brake)
- Motor control

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5.5 Recommendations for motor and inverter selection

5.5.1 General information

The motor/inverter selection is based on the comparison of nominal motor current to nominal inverter current.

5.5.2 Thermal limit characteristic curve

The mean motor speed and the effective torque are calculated during drive selection to determine the thermal loading of the motor. The operating point of the motor must be below the limit characteristic curve of the motor, otherwise the motor will be thermally overloaded.

5.5.3 Dynamic limit characteristic curve

The dynamic limit characteristic curve depicts the maximum torque the motor can generate at a certain speed. Note that the inverter must supply sufficient current for the motor to reach its maximum torque.

The base speed is especially important for configuration. The base speed is the available speed up to the maximum motor torque. In inverter operation, the base speed indicates the beginning of field weakening. The motor torque is limited by the voltage limit characteristic curve in the field weakening range, and decreases with increasing speed.

5.5.4 Motor selection for asynchronous motors

In this case, the mechanical resistance of the motor against the overload, which might exceed the permitted threshold values, must always be checked.

Asynchronous motors in LVFC control mode

Asynchronous motors are operated on the inverter exclusively in LVFC control mode.

The LVFC control mode is intended for easy open-loop operation of asynchronous motors without encoder feedback. The procedure operates an asynchronous motor on a parameterizable voltage/frequency characteristic.

To keep the magnetizing current on a constant level, the voltage (V) is adjusted in proportion to the frequency (f). The actual slip is estimated and can be compensated.

Control mode is suitable for applications with a limited speed setting range, where no dynamic step changes in load occur and where there are small requirements regarding the control characteristics.

Control mode is suitable for multi-motor drives.

Slip compensation may only be activated with rigidly coupled drives.

Speed control

The LVFC control mode is an encoder-less mode and calculates the actual speed value.

The control mode does not have a higher-level speed controller, therefore speed controller parameterization is not possible. An acceleration and torque precontrol is not possible either.

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5.6 Inverter selection

5.6.1 General information

The inverter is selected based on the course of the output current over time. The required current has to be determined from the required torque characteristic of the connected motor.

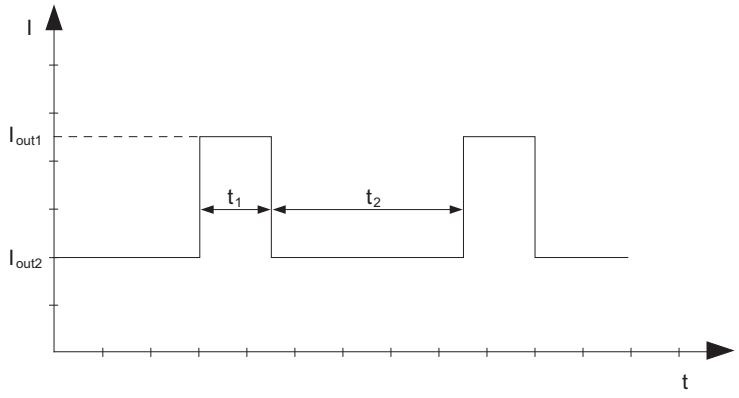
The inverters are dimensioned for a nominal output current I_N. In many applications, there is a demand for short-time overload operation. For this purpose, the inverters can be operated with a higher nominal output current for a short period of time.

For a rough selection of the inverter without using software, characteristic load cycles are provided in the following sub-chapters.

5.6.2 Overload capacity

Load cycle with base load current – typical for the selection of asynchronous motors

The characteristic load cycle consists of a base load and an overload period. In the base load period, the output current must not exceed the specified value. After the base load period, overload is possible again.



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Examples of permitted current profiles

Overload capacity with the smallest possible f_{PWM}, $f_A \geq 3$ Hz, $T_U \leq 40$ °C

Inverter	Overload current $I_{out\ 1}/I_N$	Overload time t_1	Base load current $I_{out\ 2}/I_N$	Required pause interval t_2
MCB91A-0040-5D3-2..	150%	30 s	50%	150 s
MCB91A-0025-5D3-2..	150%	15 s	50%	150 s
MCB91A-0042-2D1-2..	150%	30 s	50%	150 s
MCB91A-0034-2D1-2..	150%	15 s	50%	150 s

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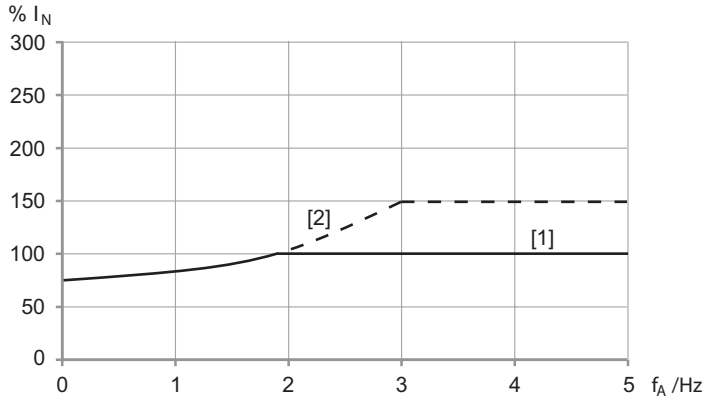
5.6.3 Power reduction factors

Due to the following operating and ambient conditions, a reduction of the output current may be necessary.

Derating due to the rotary field frequency

The specified nominal output current I_N of the inverter is the effective value. The increased load on the power semiconductors has to be considered especially for slow rotating fields and rotating fields at standstill. In case of a rotating field at standstill, direct current that can correspond to the peak value of the sine current depending on the phase position is flowing.

It is particularly important to consider output frequencies f_A < 3 Hz.



[1] Continuous output current I_{Cont} at the smallest possible PWM frequency

[2] Time-limited overload current

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Derating due to cable length, line voltage, and temperature

The following table shows the values for derating as a function of the cable length, line voltage V_{line}, and ambient temperature T:

Shielded motor cable

Clock frequency	MCB91A-....-2D1..		MCB91A-....-5D3..	
	0034	0042	0025	0040
	Without fan	With fan	Without fan	With fan
	230 V / ≤ 40 °C		400 V / ≤ 40 °C	
4 kHz	3.4 A / 75 m	4.2 A / 75 m	2.5 A / 50 m	4 A / 75 m
8 kHz	2.5 A / 35 m	4 A / 50 m	1.9 A / 12 m	3.2 A / 50 m
16 kHz	Not permitted	3.4 A / 25 m	Not permitted	1.8 A / 15 m
	230 V / 55 °C		400 V / 50 °C	400 V / 55 °C
4 kHz	2.5 A / 25 m	3.4 A / 50 m	1.8 A / 25 m	2.5 A / 30 m
8 kHz	2 A / 10 m	3.2 A / 25 m	Not permitted	1.8 A / 15 m
16 kHz	Not permitted	2.5 A / 15 m	Not permitted	1.6 A / 8 m (50 °C)
	266 V / ≤ 40 °C	266 V / 40 °C	500 V / 40 °C	
4 kHz	3.4 A / 50 m	4.2 A / 75 m	Not permitted	4 A / 50 m
8 kHz	Not permitted	4 A / 50 m	Not permitted	2.5 A / 15 m
16 kHz	Not permitted	3.4 A / 25 m	Not permitted	1.6 A / 8 m
	266 / ≤ 55 °C	266 V / 55 °C	500 V / 50 °C	
4 kHz	Not permitted	3.4 A / 25 m	Not permitted	1.6 A / 15 m
8 kHz	Not permitted	3.0 A / 15 m	Not permitted	1.3 A / 8 m
16 kHz	Not permitted	2.5 A / 15 m	Not permitted	1.1 A / 6 m

Unshielded motor cable

When using unshielded cables, 1.5 times the cable lengths mentioned above are permitted.

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5.7 EMC-compliant installation according to EN 61800-3

The inverters are designed for use as components for installation in machinery and systems. They comply with the EMC product standard EN 61800-3 "Adjustable-speed electrical drives".

Provided the EMC-compliant installation is observed, the appropriate requirements for a CE marking are met on the basis of the EMC Directive 2014/30/EU.

5.7.1 Interference emission

The cable length must be as short as possible for EMC-compliant installation. SEW-EURODRIVE recommends using low-capacity cables. To comply with limit class C1 or C3 according to EN 61800-3, the measures listed below must be taken.

Limit class C1

Inverter	Measures	
	On the line side	On the motor side
	CNF.. line filter	Shielded cables
MCB91A..	CNF..	✓

Limit class C3

Inverter	Measures	
	On the line side	On the motor side
	CNF.. line filter	Shielded cables
MCB91A..	–	✓

INFORMATION

The EMC limit values for interference emission are not specified for voltage supply systems without grounded star point (IT systems). The efficiency of filters is severely limited.

5.8 Supply system cables and motor cables

5.8.1 Supply system cable

The supply system cable is generally dimensioned system-specifically and depends on the design of the line connection. The structure of a line connection is described in chapter "Power connection" (→ 🗎 114). Observe the country-specific and system-specific regulations when selecting the cross section of the supply system cable.

Recommended cross section

The cross section of the supply system cables must be dimensioned based on the nominal line current I_{line}.

SEW-EURODRIVE suggests the following cable cross sections. These cable cross sections apply under the following conditions:

- The conductors are made of copper with PVC insulation, operating temperature 70 °C.
- The cables are routed according to IEC 60204-1 installation type C at an ambient temperature of 40 °C, accumulation 1.

MCB91A-….-5D3..	Unit	Size 0XS	
		0025	0040
Nominal output current I_N	A	2.5	4
Nominal line current AC I_{line}	A	2.3	3.6
Supply system cable L1/L2/L3	mm^2	1.5	
Fuse miniature circuit breaker/ motor circuit breaker	A	10	

MCB91A-….-2D1..	Unit	Size 0XS	
		0034	0042
Nominal output current I_N	A	3.4	4.2
Nominal line current AC I_{line}	A	8.5	9.9
Supply system cable L1/L2/L3	mm^2	1.5	
Fuse miniature circuit breaker/ motor circuit breaker	A	10	16

INFORMATION

Recommended cross section

The values are only recommendations. They are no substitute for detailed project planning of the cables depending on the concrete application and considering the applicable regulations.

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INFORMATION

Securing the supply system cable

- Secure the supply system cable with appropriate safety elements.
- When selecting the supply system cable, make sure that the selected cross section is in the range of the connectable cross section of the terminals.
- When selecting the line fuse, observe chapter "Line fuses and miniature circuit breakers" (→ 🗎 70).

5.8.2 Motor cable

Cable length

A maximum motor cable length must not be exceeded when connecting a motor.

The following configuration guidelines must be observed:

- When shielded motor cables are used, a capacitance conductor/shield of maximum 280 pF/m must not be exceeded.

MCB91A-....-5D3..	0025	0040
	Maximum motor cable length in m for shielded cable	
PWM frequency		
4 kHz	50	75
8 kHz	12	50
16 kHz	No operation possible	15

MCB91A-....-5D3..	0025	0040
	Maximum motor cable length in m for unshielded cable	
PWM frequency		
4 kHz	75	112.5
8 kHz	18	75
16 kHz	No operation possible	22.5

MCB91A-....-2D1..	0034	0042
	Maximum motor cable length in m for shielded cable	
PWM frequency		
4 kHz	75	75
8 kHz	35	50
16 kHz	No operation possible	25

MCB91A-....-2D1..	0034	0042
	Maximum motor cable length in m for unshielded cable	
PWM frequency		
4 kHz	75	112.5
8 kHz	52.5	75
16 kHz	No operation possible	37.5

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Voltage drop

Select the cable cross section of the motor cable in a way that a maximum of 5% voltage drop occurs at nominal current of the motor. Read the information in the relevant motor catalogs. An excessively high voltage drop means that the full motor torque is not achieved.

5.9 Line components

5.9.1 Line fuses and miniature circuit breakers

Line fuses and miniature circuit breakers are used for protecting the supply system cables. A motor circuit breaker can be used as an alternative. For fusing, use fuses, miniature circuit breakers, or motor circuit breakers with the following properties:

Type class	Prerequisite
Fuses in utilization categories gL, gG	Nominal voltage ≥ nominal line voltage
Miniature circuit breaker with characteristics B, C, D	Nominal voltage ≥ nominal line voltage
Motor circuit breaker	Nominal voltage ≥ nominal line voltage

Select the rated current of the fuse according to the table in chapter "Recommended cross section for nominal operation" (→ 🗎 68).

If project planning is available, smaller rated currents may be selected for fusing:

- The effective current requirement for the application is determined in the SEW-Workbench. Select the rated current of the fusing at least 10% higher than the specification "Line supply: Calculated effective current".
- If a motor has already been assigned but no SEW-Workbench calculation is available, select the rated current of the fusing at least 10% higher than the nominal motor current.

For fusing, observe the country-specific and system-specific regulations and, if necessary, the notes in chapter "UL-compliant installation".

5.9.2 Line contactor

A line contactor is used to separate the inverter from the supply system in the event of a fault and to switch the power supply on and off.

For more information, refer to chapter "Using the line contactor" (→ 🗎 104).

5.9.3 CNF.. line filter

A line filter reduces interference emission via the supply system cable, which is generated by the inverter. The line filter mainly serves to meet interference voltage limit requirements in the frequency range from 150 kHz to 30 MHz at the line connection. In addition, a line filter dampens the interference from the grid affecting the inverter. The choice of line filter depends on the nominal line current and the line voltage of the inverter.

5.9.4 Selecting the residual current device

The inverter can cause a direct current in the PE conductor.

Proceed as follows to select the residual current device:

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1. If using a residual current device is not mandatory according to the standards, SEW-EURODRIVE recommends not using a residual current device.
2. ⚠ **WARNING!** No protection against electric shock if an incorrect type of residual current device is used. Severe or fatal injuries.
   If a residual current device (residual current device RCD or residual current monitor RCM) is provided, use an all-current-sensitive RCD or RCM of type B.
3. If a residual current device is required, select the residual current device according to the requirements for protecting persons, fire protection or system protection. Observe the tripping characteristic, the deceleration and the rated tripping current of the residual current device during selection.
4. During project planning, note that leakage currents which are as low as possible occur in the system for operational reasons.
5. If the operational leakage currents are too high, you can distribute the current supply among several RCDs.

5.10 24 V supply voltage selection

5.10.1 Description

The inverters have an internal 24 V voltage supply.

The internal 24 V switched-mode power supply has an available power of 6 W. As soon as a gateway is plugged into an inverter, it must be supported with an external 24 V supply voltage. All other inverters connected to a gateway via a CFC11A communication module are supplied via the gateway and do not require an additional 24 V supply.

5.10.2 Project planning for 24 V supply power

The power consumption of all components is required for dimensioning the 24 V supply voltage. The 24 V voltage supply must provide the sum of all powers.

INFORMATION

The power peaks during switch-on (caused by internal capacitances present in the devices) must not be taken into consideration as those capacitances are very small. Commercially available switched-mode power supplies can reliably switch on the maximum occurring capacities.

5.10.3 Power consumption of the 24 V supply

Inverter and options

The following table shows the power consumption of the 24 V supply for the individual components.

Inverter and options	Unit	Power consumption without I/O
MCB91A-....-5D3..	W	1
MCB91A-....-2D1..	W	1
Gateway CFX11A..	W	3
CFC11A communication module	W	0.5

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5.10.4 Project planning example

The following project planning example shows the project planning of the 24 V voltage supply:

- The digital inputs of the inverters are controlled with external DC 24 V voltage.
- The VO24 auxiliary voltage output on the inverter does not output voltage if the inverter is only supplied with DC 24 V backup voltage via the gateway.
- A network of 4 MOVITRAC® classic or MOVITRAC® basic inverters is established.
- A gateway is plugged into the 1st inverter.
- Communication modules are plugged into the other 3 inverters.

In this case, only the gateway is supplied with an external DC 24 V voltage. All other devices are supplied by the gateway via the ribbon cable.

This results in a power demand of 4 × 1 W + 1 × 3 W + 3 × 0.5 W = 8.5 W.

5.11 FCB concept

The FCB concept describes the modular firmware design of inverters from the MOVI-C® modular automation system with which it is ensured that a wide range of drive functions can be selected or deselected quickly and easily using control words.

All primary functions are selected as FCBs. For example, positioning control requires the FCB 09, while speed control is implemented with FCB 05.

You can switch between different FCBs at any time. Switching to another FCB takes place with a maximum delay of 0.5 ms.

Different priorities are assigned to the FCBs. If an FCB with a higher priority than the currently active FCB is selected, the FCB with the higher priority is activated.

5.11.1 List of FCBs

The FCBs are sorted in descending order of their priority in the following list:

- FCB 01 Output stage inhibit
- FCB 14 Emergency stop
- FCB 13 Stop at application limits
- FCB 04 Manual mode
- FCB 05 Speed control
- FCB 26 Stop at user limits
- FCB 02 Default stop

5.11.2 Description of the FCBs

FCB 01 Output stage inhibit

Activating FCB 01 stops the connected motor via the motor brake. If no brake is installed, the motor coasts to a stop.

FCB 02 Default stop

FCB 02 stops the drive with the preset profile value "Maximum deceleration". This value is limited by the "Application limit – deceleration".

FCB 02 is active (default) when no other FCB is selected.

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FCB 02 is selected by the system, not by the operator.

FCB 04 Manual mode

The function block can be selected and activated via the function "Manual mode" using the MOVISUITE® engineering software. Manual mode is used for startup or for setup mode without a higher-level controller.

FCB 04 is selected by the system, not by the operator.

FCB 05 Speed control

The inverter can be operated as a speed-controlled axis.

The user can specify profile values for acceleration, deceleration, and jerk as the basic condition for speed control. The actual speed setpoint for the drive controller is generated in the controller cycle with the specified limit values by a profile generator integrated in the inverter.

FCB 13 Stop at application limits

When FCB 13 is activated, the drive stops with speed control using the preset application limit deceleration.

FCB 14 Emergency stop

When FCB 14 is activated, the drive stops with the preset emergency stop deceleration.

The emergency stop deceleration should always be greater than or equal to the "Application limit deceleration". If a smaller deceleration value than the "Application limit deceleration" is specified for the emergency stop deceleration, the "Application limit deceleration" is used as the emergency stop deceleration.

FCB 26 Stop at user limits

FCB 26 is used for stops at user limits. The user limits are either available as local setpoints or initiate the deceleration ramp set via the fieldbus.

When the stop is reached, the brake remains released and the motor remains energized.

5.11.3 Setpoints and limits in the FCBs

The following table shows which FCBs use which setpoints and profile values.

Setpoint buffer	FCB					
	02	04	05	13	14	26
Speed	–	–	✓	–	–	–

Profile value buffer	FCB					
	02	04	05	13	14	26
Maximum acceleration	–	–	✓	–	–	–
Maximum deceleration	✓	–	✓	–	–	✓
Jerk time	–	–	✓	–	–	✓

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Application limits	FCB					
	02	04	05	13	14	26
Speed, positive/negative	–	✓	✓	–	–	–
Acceleration	–	✓	✓	–	–	–
Deceleration	–	✓	✓	✓	–	✓
Jerk time	✓	✓	✓	✓	✓	✓
Apparent output current	✓	✓	✓	✓	✓	✓
Voltage	✓	✓	✓	✓	✓	✓
Emergency stop deceleration	–	–	–	–	✓	–

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5.12 UL-compliant installation

INFORMATION

Due to UL requirements, the following chapter is always printed in English and in some cases in French, regardless of the language of this documentation.

Observe the following notes for UL-compliant installation:

Use only tested units with a limited output voltage (V_{max} = DC 30 V) and limited output current (I_{max} = 8 A) as an external DC 24 V voltage source.

Use in a Pollution Degree 2 environment.

5.12.1 Field wiring power terminals

- Use 75 °C copper conductors only.
- Tightening torque for field wiring terminals:

Connection		Tightening torque in-lbs (Nm)
Line connection	X1	4.4 – 5.3 (0.5 – 0.6)
Motor connection	X2	
PE connection	–	10.6 – 13.3 (1.2 – 1.5)
Other M4 screw connections	M4	12.4 – 14.2 (1.4 – 1.6)

5.12.2 Short circuit current rating

Suitable for use on a circuit capable of delivering not more than 18 000 rms symmetrical amperes when protected by fuses or inverse time circuit breakers as described in the tables below.

Max. voltage is limited to 240 V (230 V units only) or 500 V (400 V units only).

5.12.3 Branch circuit protection

Integral solid state short circuit protection does not provide branch circuit protection. Branch circuit protection must be provided in accordance with the National Electrical Code and any additional local codes (US) or Canadian Electrical Code, Part 1 (CA).

WARNING - The opening of the branch-circuit protective device may be an indication that a fault current has been interrupted. To reduce the risk of fire or electric shock, current-carrying parts and other components of the controller should be examined and replaced if damaged. If burnout of the current element of an overload relay occurs, the complete overload relay must be replaced.

ATTENTION - LE DÉCLENCHEMENT DU DISPOSITIF DE PROTECTION DU CIRCUIT DE DÉRIVATION PEUT ÊTRE DÛ À UNE COUPURE QUI RÉSULTE D'UN COURANT DE DÉFAUT. POUR LIMITER LE RISQUE D'INCENDIE OU DE CHOC ÉLECTRIQUE, EXAMINER LES PIÈCES PORTEUSES DE COURANT ET LES AUTRES ÉLÉMENTS DU CONTRÔLEUR ET LES REMPLACER S'ILS SONT ENDOMMAGÉS. EN CAS DE GRILLAGE DE L'ÉLÉMENT TRAVERSÉ PAR LE COURANT DANS UN RELAIS DE SURCHARGE, LE RELAIS TOUT ENTIER DOIT ÊTRE REMPLACÉ.

For maximum branch circuit protection see tables below.

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SCCR: 18 kA / 1 × 240 V			
Model (frame size)	**Non-semiconductor fuses (currents are maximum, voltages minimum values)**	**Inverse-time circuit breaker (currents are maximum, voltages minimum values)**	**Type E combination motor controller, mfd by Siemens, type Sirius (rated 480 V/277 V)**
MCB91A-0034-2.1-2.. (0XS)	10 A/250 V	15 A/240 V	3RV2011-1JA10, 10 A
MCB91A-0042-2.1-2.. (0XS)	15 A/250 V	15 A/240 V	3RV2011-1JA10, 10 A

SCCR: 18 kA / 3 × 500 V			
Model (frame size)	**Non-semiconductor fuses (currents are maximum, voltages minimum values)**	**Inverse-time circuit breaker (currents are maximum, voltages minimum values)**	**Type E combination motor controller, mfd by Siemens, type Sirius (rated 480 V/277 V)**
MCB91A-0025-5.3-2.. (0XS)	10 A/600 V	15 A/500 V	3RV2011-1CA10, 2.5 A
MCB91A-0040-5.3-2.. (0XS)	15 A/600 V	15 A/500 V	3RV2011-1EA10, 4.0 A

5.12.4 Motor overload protection

The devices are provided with load and speed-sensitive overload protection and thermal memory retention upon shutdown or power loss.

The trip current is adjusted to 150 % of the rated motor current.

5.12.5 Surrounding air temperature rating

For surrounding air temperature rating, refer to chapter "General technical data".

5.12.6 Derating

For derating, refer to chapter "Selecting an inverter" of the product manual.

5.12.7 Other ratings

Type rating	Open type
Max. altitude	2000 m

5.12.8 Wiring diagrams

For wiring diagrams, refer to chapter "Electrical Installation".

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6 Prefabricated cables

6.1 System bus cables

The system bus cable is used to connect the devices with the EtherCAT®/SBUS^{PLUS} interface.

The RJ45 connectors and the socket contacts in the inverters have been checked for mechanical stability and contact reliability by SEW-EURODRIVE. SEW-EURODRIVE recommends using the cables listed below. If other cables and connectors are used, SEW-EURODRIVE makes no statement about the quality of the plug-in connection.

NOTICE

Using the wrong cables.

Inverter damage.

The system bus cables may only be designed with RJ45 connectors with 4-pin assignment. When using an RJ45 connector with 8-pin assignment at this point, malfunctions or defects may occur at the connected devices.

When RJ45 cables are being used, it must be ensured that the RJ45 connectors are equipped with all contacts.

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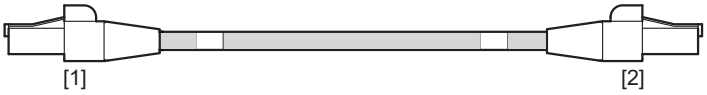
6.1.1 Overview



9007214291596811

[1] Connector, red [2] Connector, red

The 4-pin system bus cable [2] for EtherCAT® and SBus^{PLUS} is used between the automation components.

Some of these automation components are:

- MOVI-C® CONTROLLER
- Inverter
- PC with MOVISUITE® engineering software
- MOVI-PLC® I/O system
- Additional EtherCAT® stations on the EtherCAT®/SBus^{PLUS}

6.1.2 Cable assignment

The cable is available in the following lengths for fixed installation:

Cable length	Part number
0.29 m	18179959
0.44 m	18179967
0.75 m	18167039
1.5 m	18179975
3 m	18167047
5 m	18179983
10 m	18179991

If you use system bus cables from other manufacturers, it is necessary to comply with the relevant requirements of the "EtherCAT® Technology Group" (ETG). On this subject, note the "EtherCAT® Installation Guideline" from the ETG.

6.1.3 RJ45 connector

SEW-EURODRIVE recommends using the following connectors from Harting if the prefabricated cables from SEW-EURODRIVE are not used.

Harting order designation	Description	Conductor cross section
RJ45 CONNECTOR, PLUG, 4P4C, CAT5, 09451511100	RJ45 connector to IEC 60603-7, 4-pin	• Litz wires: 0.22 – 0.32 mm^2 • Wire: 0.26 – 0.32 mm^2 • Cable jacket: Ø 6.1 to 6.9 mm
RJ45 CONNECTOR, PLUG, 8P4C, CAT5, IDC09451511109		• Litz wires: 0.12 mm^2 • Cable jacket: Ø 6.1 to 6.9 mm

Connector characteristics:

- Can be preassembled in the field without tools

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- Transmission category CAT 5
- Suitable for connecting litz wires and wires
- UL approval

6.1.4 Pin assignment

The prefabricated system bus cables are assigned according to EIA/TIA-568A. Also use this assignment for prefabrication in the field.

Contact	Conductor color	Function
1	White/green	RX+
2	Green	RX-
3	White/orange	TX+
4	Reserved	–
5	Reserved	–
6	Orange	TX-
7	Reserved	–
8	Reserved	–

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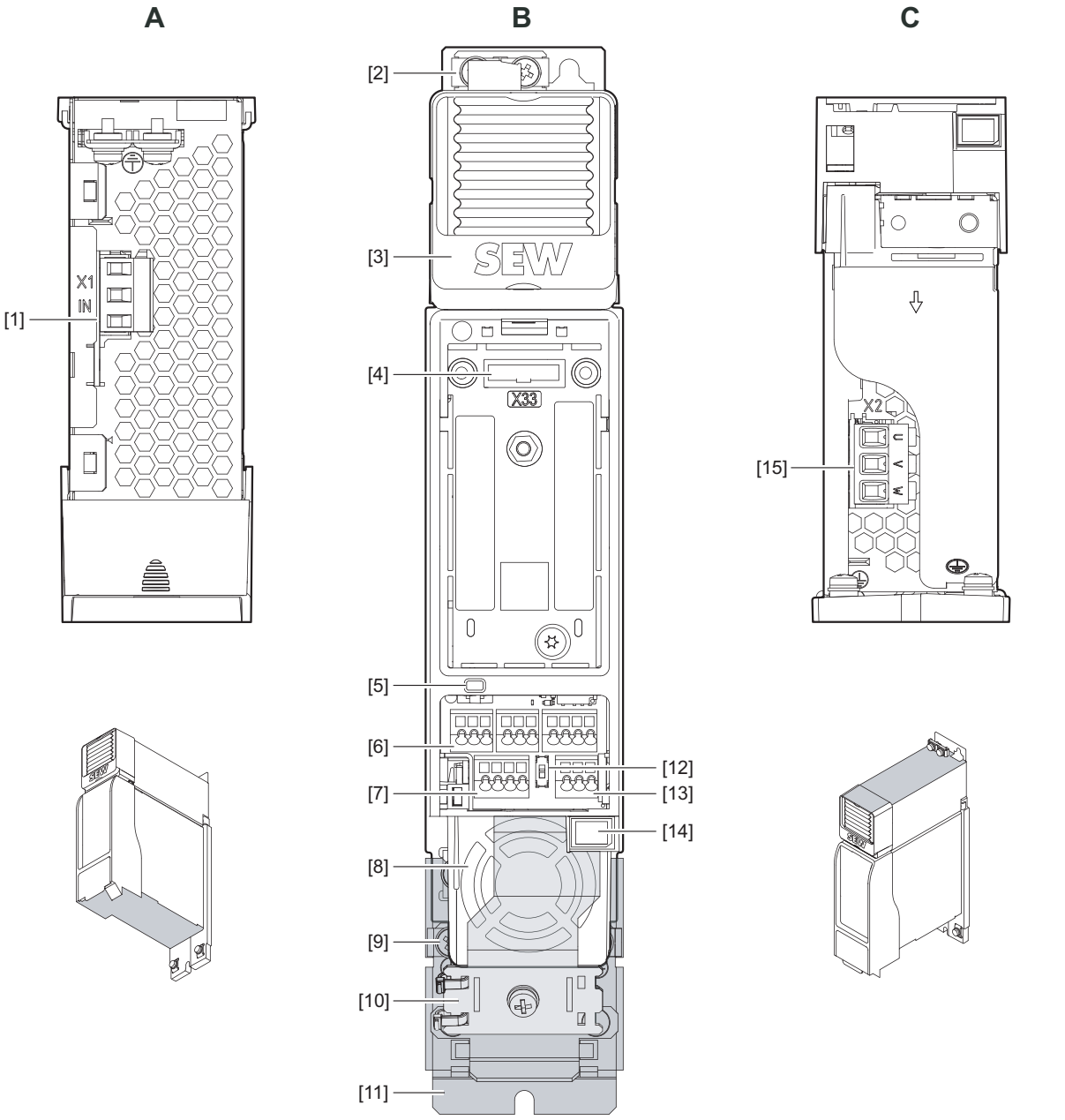
7 Device structure

7.1 Inverter



50090669707

A View from top
[1] X1: Connection for supply system

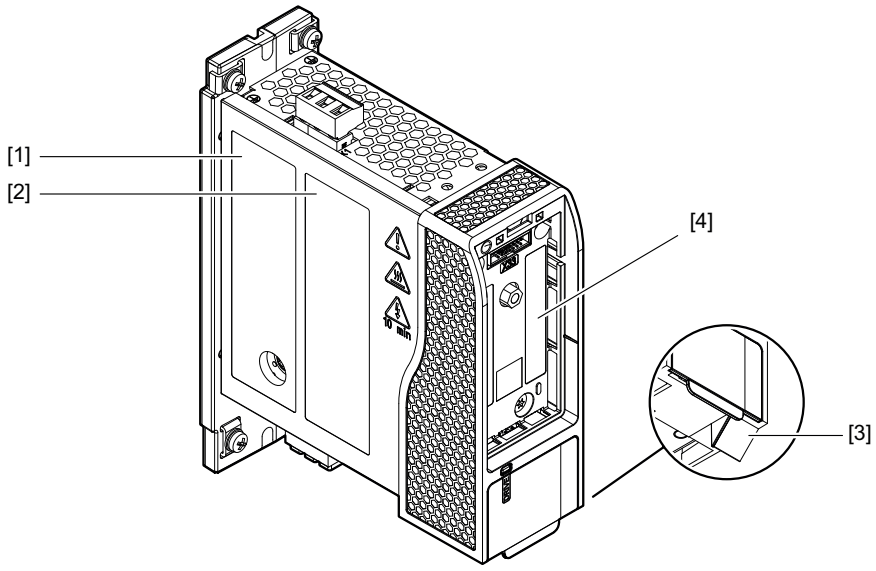
B View from front
[2] 2 × housing PE connection
[3] Line filter CNF11A or CNF31A
[4] X33: Interface for CDM11A or CBG01A
[5] Status LED
[6] X20: Digital inputs or digital outputs and motor temperature monitoring
[7] X23: Analog inputs or analog outputs
[8] service kit
[9] 2 × shield plate PE connection
[10] Shield plate for signal cables
[11] Shield plate for power cables
[12] S4: Changeover analog input mA/V
[13] X22: Isolated relay contact
[14] Product label with QR code

C View from below
[15] X2: Motor connection

7.2 Nameplates

7.2.1 Nameplate positions

The following figure shows an example of the position of the nameplates and labels on the inverter:



50610953739

[1] System nameplate
[2] Performance data nameplate
[3] Product label
[4] Brief nameplate

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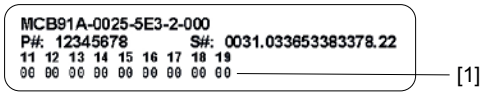
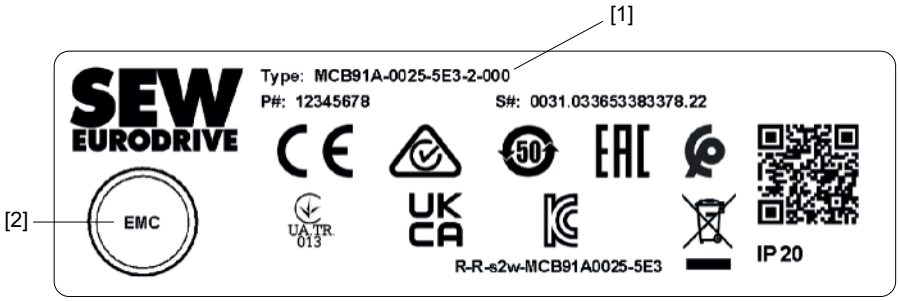
7.2.2 Example of brief nameplate



54522233611

[1] Device status

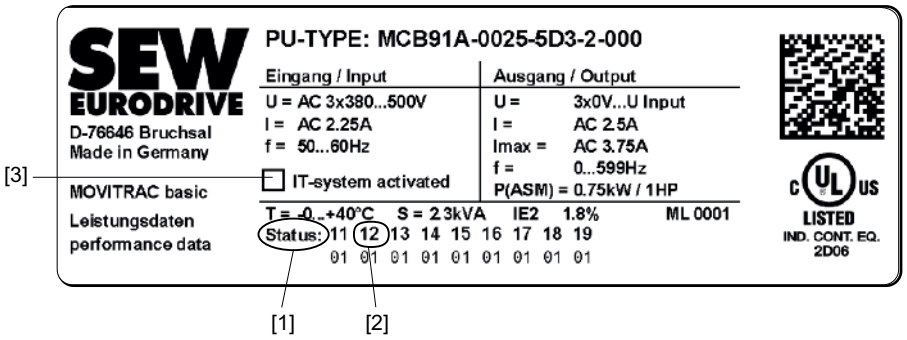
7.2.3 Example of system nameplate



9007235226085259

[1] Type designation
[2] Area for deactivating the EMC capacitors

7.2.4 Example of rating plate performance data



9007235229203339

[1] Device status
[2] Firmware version
[3] Box checked when EMC capacitors are disabled

7.2.5 Product label

	Product label with QR code. The QR code can be scanned. You will be redirected to the Digital Services of SEW-EURODRIVE. There, you have access to product-specific data, documents, and further services. **The product manual of the device with further information is available in the "Documentation" > "Data and documents" area.**

7.3 Type designation

Example: MCB91A-0025-5D3-2-000	
MC	**Product name** MOVITRAC®
B	**Device type** B = Basic
91	**Series** 91 = With DC 24 V switched-mode power supply
A	**Version** A = Version status of the device series
0025	**Performance class** 0025 = Nominal output current – e.g. 0025 = 2.5 A
5	Connection voltage 2 = AC 200 – 240 V 5 = AC 200 – 500 V
D	**EMC variant** D = EMC filter limit value category C3 in accordance with EN 61800-3
3	**Connection type** 1 = 1-phase connection 3 = 3-phase connection
2	**Operating mode** 2 = 2-quadrant operation
0	**Variants** 0 = Standard
0	**Technology level** 0 = Standard
0	**Application level** 0 = Standard/MOVIKIT® Velocity Drive

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8 Mechanical installation

8.1 Installation notes

According to the degree of protection, the inverter is intended exclusively for installation in a control cabinet.

Observe the following information:

- Only install the device on a level, low-vibration, and torsionally rigid support structure.
- Observe the weight of the deviceand the permissible tightening torques of the fasteners.
- Check the validity of the degree of protection using the information in the operating instructions and the data on the nameplate.
- Make sure that the cooling air supply is unobstructed; warm exhaust air from other devices must not influence the cooling.

8.2 Installation requirements

Check that the following conditions have been met:

- The device is undamaged (no damage caused by transport or storage).
- The ambient temperature corresponds to the specification in the operating instructions and the nameplate.

Refer to the ambient conditions in the **Product manual** > chapter "Technical data" (→ 🗎 30).

8.3 Minimum clearance and mounting position

Observe the following information:

- To ensure unobstructed cooling, leave a minimum clearance of 100 mm above and below the inverter housings. Ensure that the air circulation in this clearance is not impaired by cables or other installation equipment.
- Make sure that the inverters are not exposed to the exhaust air from other units.
- Only install the inverters vertically. Do not install them horizontally, tilted, or upside down.
- The inverters can be installed directly next to each other without any clearance.

INFORMATION

Special bending spaces are required according to EN 61800-5-1 for cables with a cross section of 10 mm^2 and larger. Increase the size of the spaces if necessary.

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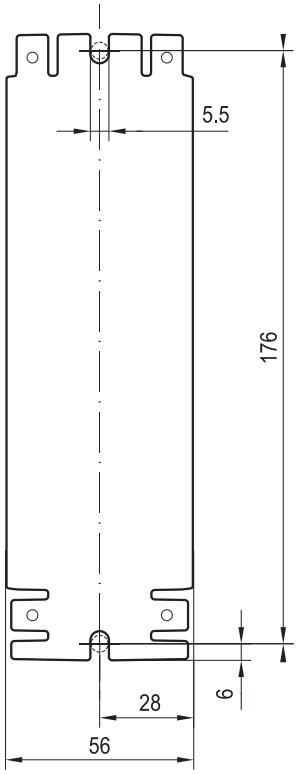
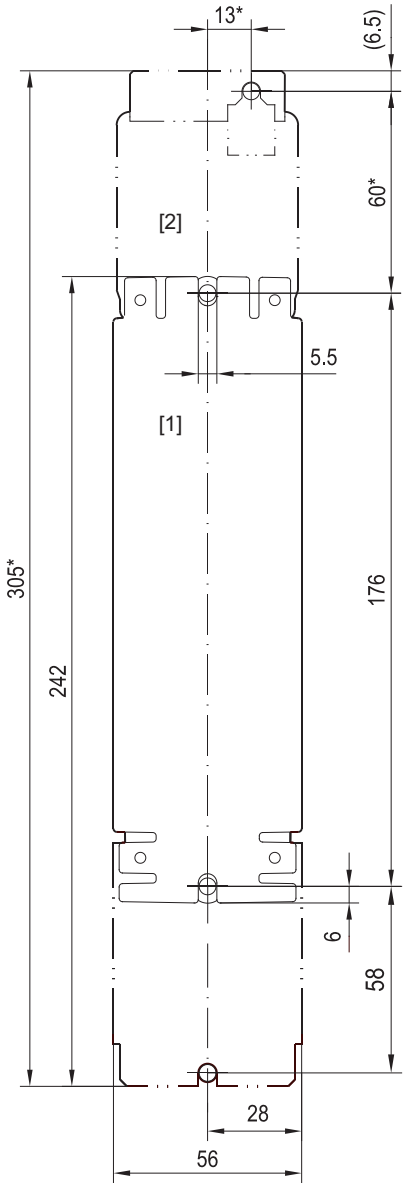
8.4 Preparing the control cabinet back panel

Proceed as follows:

1. Drill the holes according to the following drilling diagram.
2. Cut the internal thread in the holes according to the screw size used.

Bore pattern without line filter and shield plate	Bore pattern with line filter and shield plate
	

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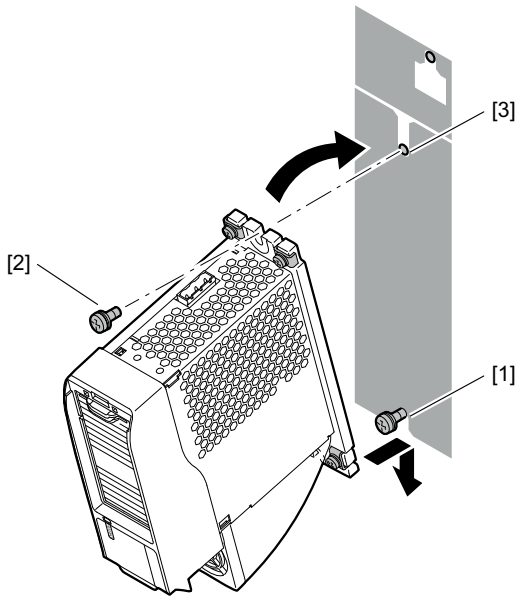
8.5 Installing the inverter

INFORMATION

When using gateways and communication modules, all inverters must be mounted flush next to each other

Proceed as follows:



9007235267140107

The retaining screw [1] is screwed into the prepared tapped hole in the mounting plate in the control cabinet but is not tightened.

1. Place the inverter with the slotted hole in the device base plate onto the retaining screw [1] from the top.
2. Push the inverter backwards to insert the retaining screw [2] into the upper hole in the device base plate and the tapped hole in the mounting plate.
3. Tighten the retaining screws [1] and [2].

Observe the corresponding bore pattern if the installation takes place with the line filter attached.

To disassemble the inverter, perform the assembly steps in reverse order.

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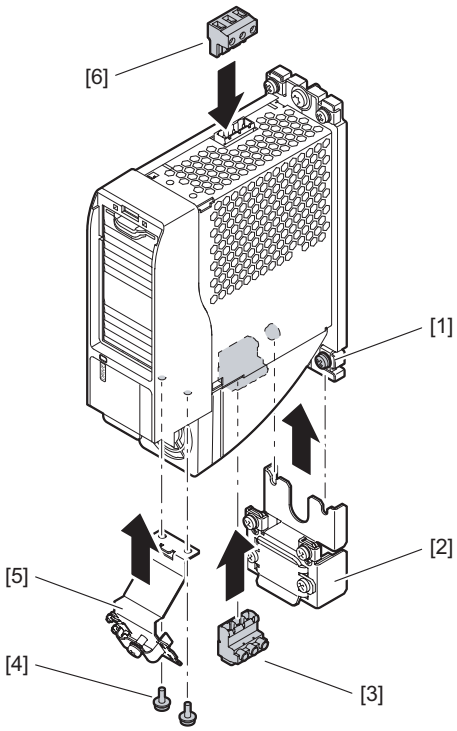
8.6 Installing the shield plate

The shield plate enables the installation of the cables for motor and brakes as well as the control and signal cables. The shield plate for the motor and brake cable is included in the scope of delivery for inverters.



9007236740396171

[1] Retaining screws for the shield plate for power cables
[2] Shield plate for power cables
[3] X3: Motor connection
[4] Retaining screws for the shield plate for signal cables
[5] Shield plate for signal cables
[6] X1: Connection for supply system

Proceed as follows:

1. Unscrew both retaining screws [1] far enough that the rear shield plate [2] can be inserted.
2. Install the shield plate [2].
3. Tighten the retaining screws [1].
4. Install the front shield plate [5] as shown and tighten the retaining screws [4].

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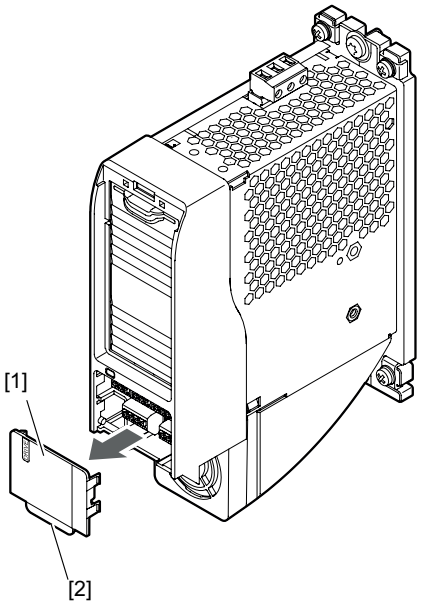
8.7 Removing and attaching the cover

The digital and analog inputs/outputs are equipped with a cover [1].



36000418315

Removing the cover

Proceed as follows:

1. Pull the tab [2] with your finger.
2. Remove the cover.

Attaching the cover

Proceed as follows:

3. Place the cover onto the housing, the plastic detents facing the housing.
4. Push it inwards.

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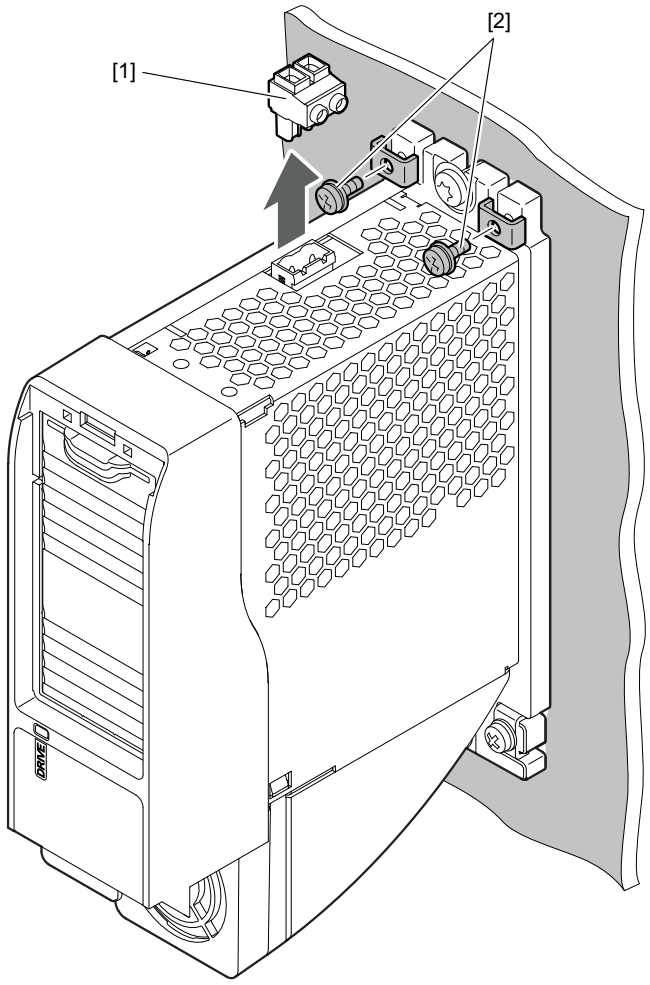
8.8 Installing the line filter

INFORMATION

Note that the inverter must be installed in the control cabinet before you install the line filter.

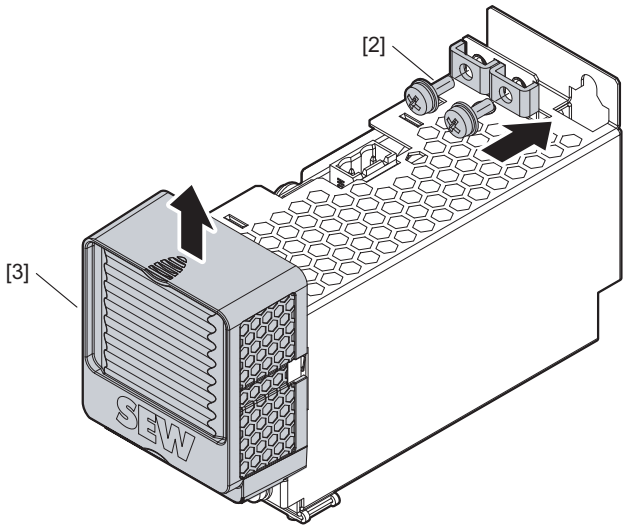
Proceed as follows:



9007235190432139

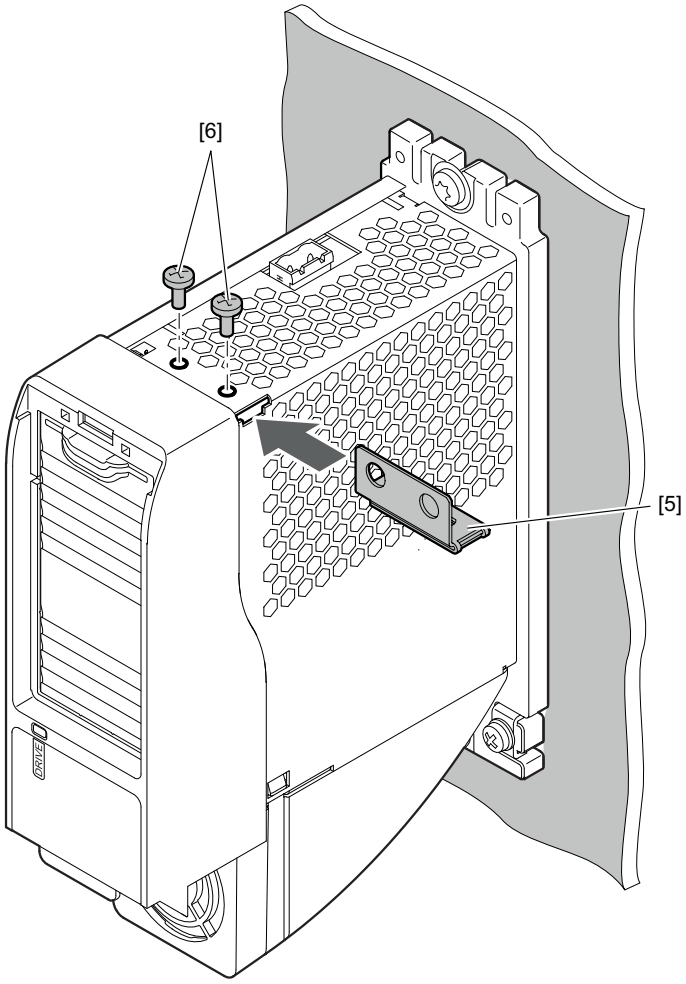
1. Remove the power plug [1] from the inverter.

2. Unscrew both PE screws [2] from the inverter and remove the terminal boards.



9007235190429707

3. Place terminal boards underneath the two PE screws [2] and screw them back onto the line filter.
4. To make the two mounting holes accessible, slide the plastic cover upward.



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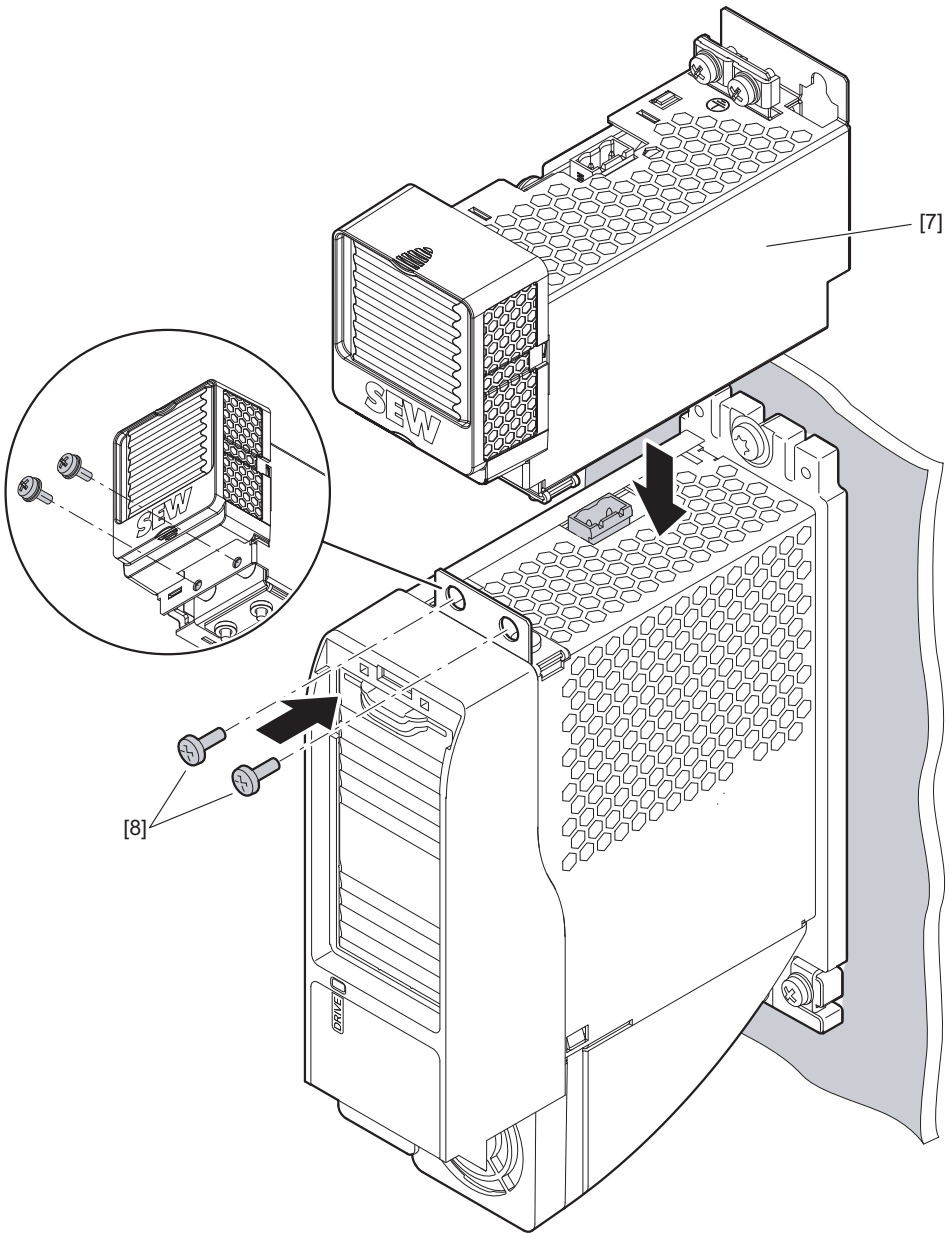
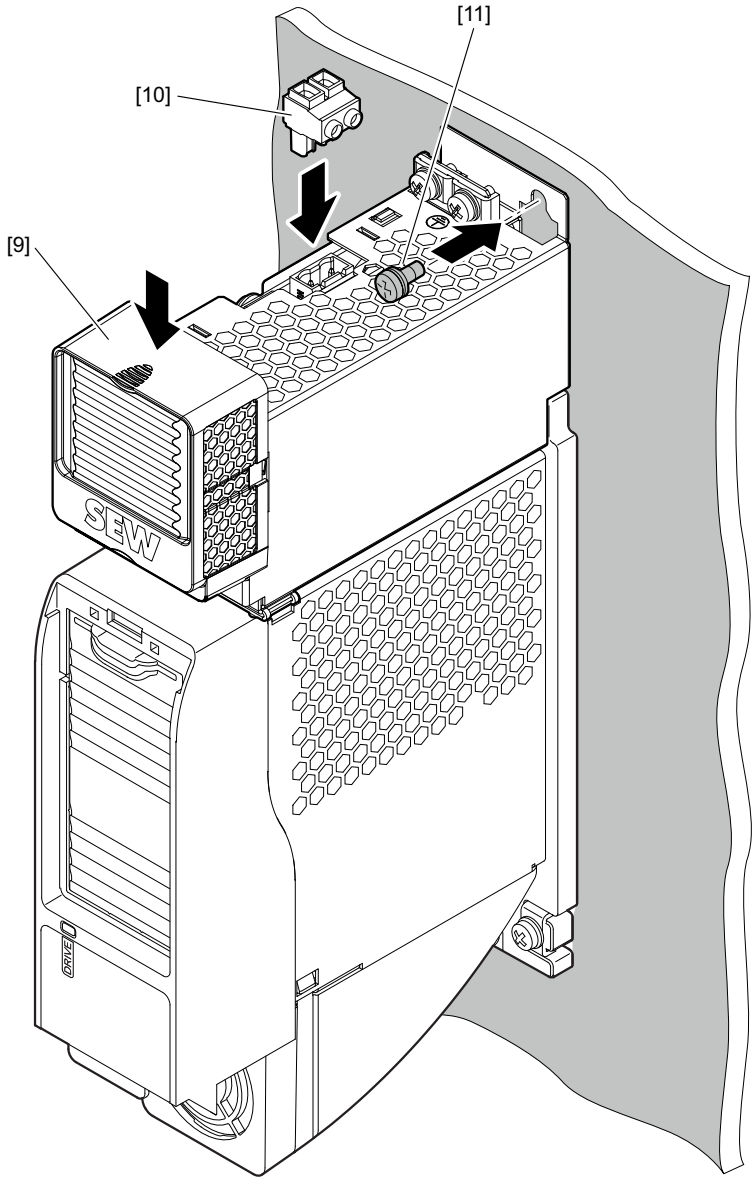
5. Slide the fastening plate [5] into the designated recess in the inverter housing. Fasten the mounting plate using 2 retaining screws [6].



9007235190437003

6. Place the line filter [7] onto the inverter so that the power plug of the line filter fits into the socket contact on the inverter.

7. Screw in the 2 retaining screws [8].



9007235190439435

8. Slide the plastic cover down.
9. Insert the power plug [10] into the socket contact of the line filter.
10. Screw in the retaining screw [11] on the line filter.

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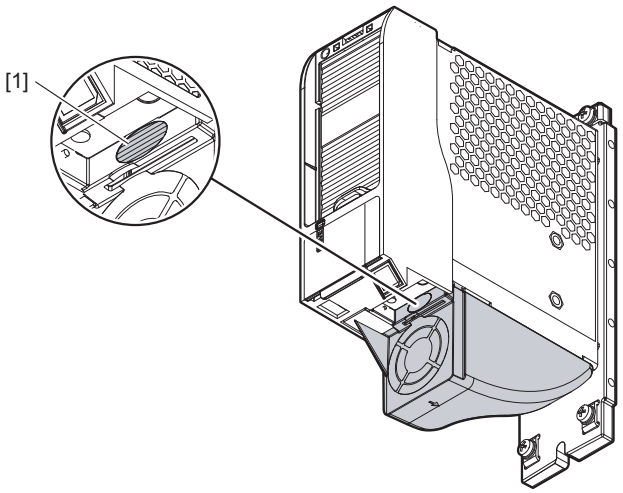
8.9 Removing the fan

For certain types of work it is necessary to remove the fan from the inverter.

Proceed as follows:

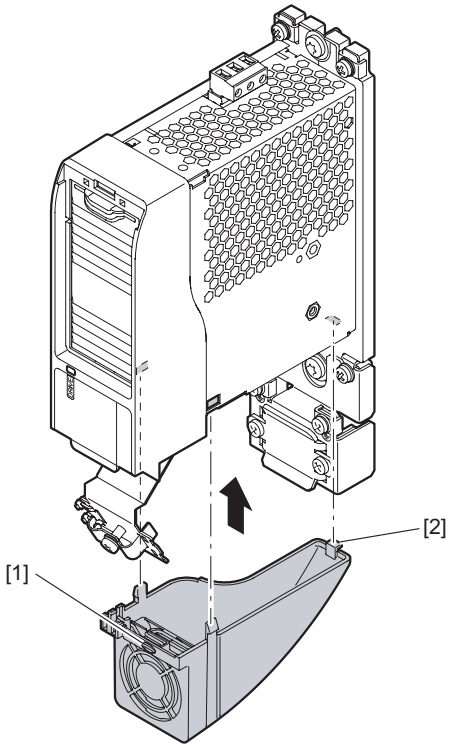


9007235192809611

1. Press the tab [1] and pull the fan down and away from the inverter.

8.10 Attaching the fan

Proceed as follows:



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1. Align the detent on the fan [2] with the inverter housing.
2. Swing the fan forward and up until the tabs [1] snap into place in the inverter housing.

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8.11 Mounting the keypad

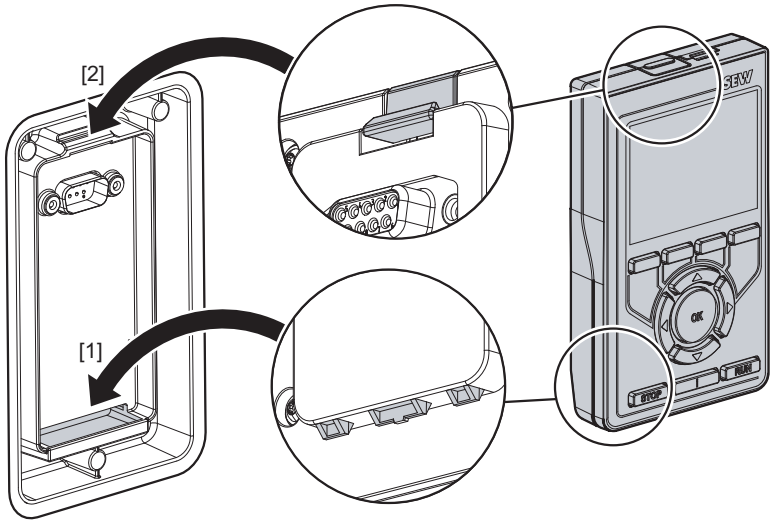
The following procedure shows the mounting of the keypads using the CBG21A keypad as an example.

8.11.1 Attaching the keypad

Proceed as follows:

1. Place the keypad in the lower recess on the front [1]. Make sure that the retaining lugs are seated in the recesses on the inverter.
2. Push the top of the keypad toward the inverter [2] until it audibly clicks into place.

⇨ As soon as the connection to the inverter is established, the start menu is displayed.



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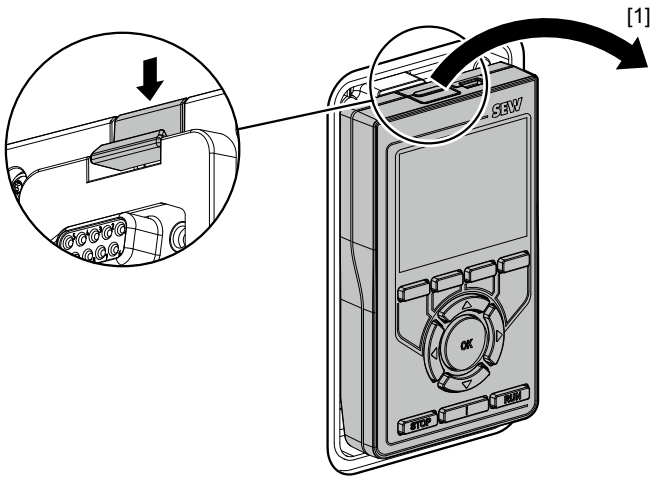
8.11.2 Removing the keypad

Proceed as follows:

1. Press and hold the red unlatch button [1] of the keypad downwards.
2. Tilt the top of the keypad forward.
3. Remove the keypad from the recess on the front.



49740571147

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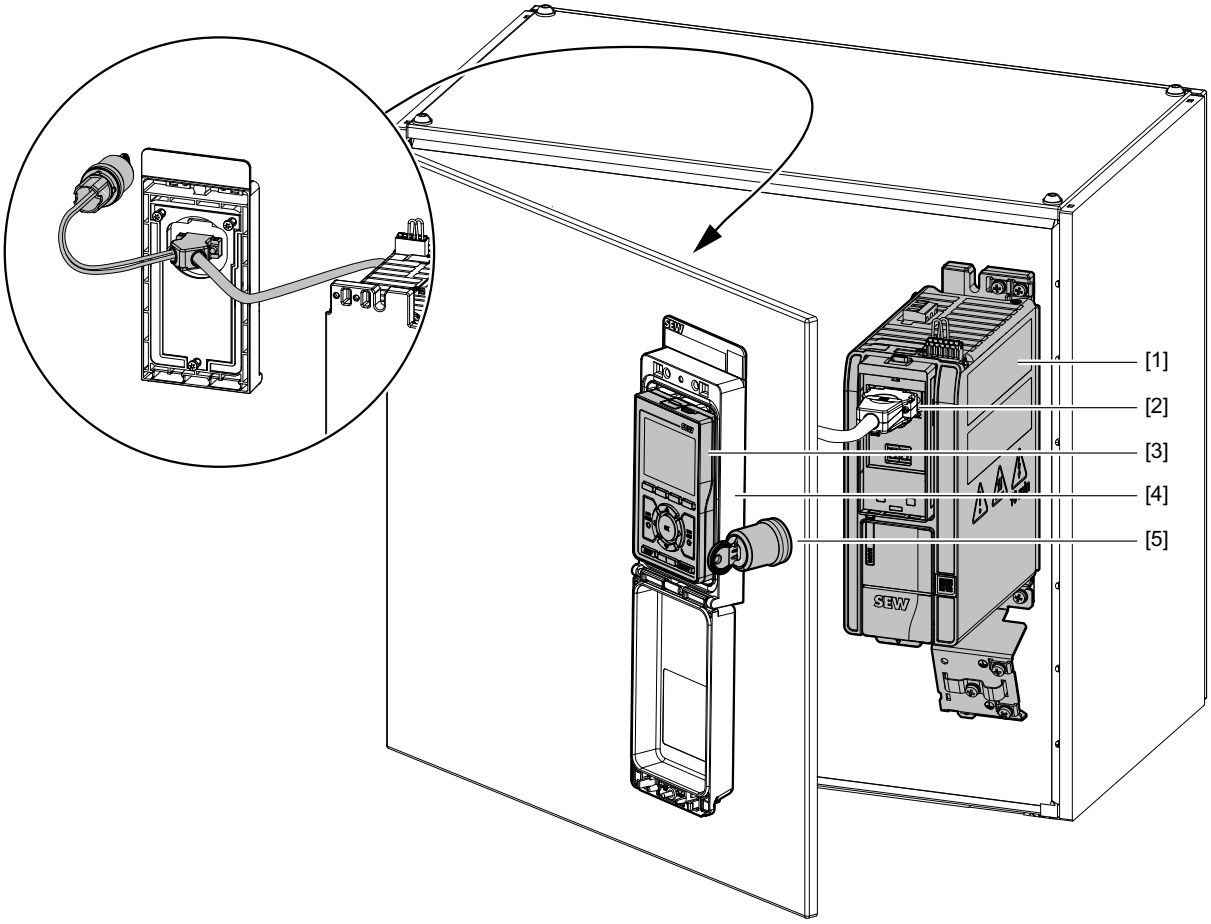
8.12 Mounting the CBG22A local keypad

Mount the local keypad remotely from the inverter using the UKS52A cable with an additional contact for a key switch, for example in a COG11A door mounting frame. The key switch activates manual mode in the local keypad.



9007250463743243

[1] Inverter (example illustration)
[2] D-Sub cable, 9-pin
[3] CBG22A local keypad
[4] COG11A door mounting frame
[5] Key switch (not available from SEW-EURODRIVE)

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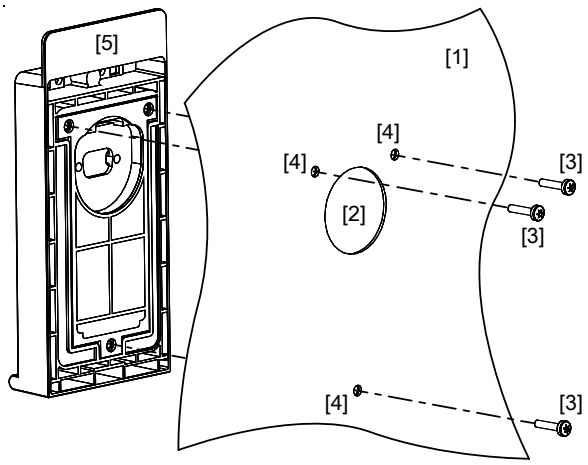
8.13 Mounting the COG11A door mounting frame



18014433169265931

Proceed as follows:

1. Fasten the drilling template to the mounting surface [1].
2. Center punch the 5 mm bores [4] for the screws [3] and the 40 mm bore [2] for the D-sub connector using the drilling template.
3. Remove the drilling template.
4. Drill the bores.
5. Clean the mounting surface [1].
6. Place the door mounting frame [5] from outside onto the mounting surface [1].
7. Fix the door mounting frame in place using the screws [3] supplied (max. 2.5 Nm).
8. If you are using a UKS52A cable, insert the port saver from behind through the 40 mm bore [2] and tighten the screws evenly.
9. Insert the D-sub connection cable from behind through the 40 mm bore [2] and tighten the screws evenly.
10. Connect the connection cable to the inverter and tighten the screws evenly.
11. Open the cover.
12. Insert the keypad and perform a functional check.
13. Close the cover and tighten the cover screw (1.2 – 1.4 Nm).

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9 Electrical installation

9.1 Installation planning considering EMC aspects

You can optimize the system with regard to electromagnetic compatibility or eliminate existing EMC interference.

The notes in this chapter are not legal regulations, but rather recommendations for improving the electromagnetic compatibility of your system.

For further notes on EMC-compliant installation, refer to the publication Drive Engineering – Practical Implementation edition "EMC in Drive Engineering – Basic Theoretical Principles and EMC-Compliant Installation in Practice".

9.1.1 Compliance with the limit classes

Compliance with the limit classes has been tested in a CE-typical drive system. SEW-EURODRIVE can provide detailed information on request.

9.1.2 Control cabinet

Use control cabinets with electrically conductive (galvanized) mounting plates. If several mounting plates are used, connect them in such a way that they are conductive over a large area. EMC-compliant installation of the inverter is only possible with a mounting plate that is conductive over a large area.

9.1.3 Equipotential bonding

Regardless of the PE connection, it is essential that **low-impedance, HF-compatible equipotential bonding** is provided (see also EN 60204-1):

- Mount the line filter and inverter on a shared mounting plate. Make sure they are connected over as large an area as possible and with good conductivity.
- Make sure that there is a suitable equipotential bonding between the system, the control cabinet, the machine structure, the cable ducts, and the gearmotor:
  - Use the mounting plate as the star point with regard to the HF equipotential bonding.
  - Connect the PE busbar to the mounting plate in an HF-compatible manner.
  - Connect the sheet metal cable ducts to the control cabinet in an HF-compatible manner.
  - Connect the cable ducts to the mounting plate in the control cabinet in an HF-compatible manner.
  - Connect the parts of the sheet metal cable ducts together in an HF-compatible manner.
  - Connect the sheet metal cable ducts to the gearmotor in an HF-compatible manner.
- Ensure that shielded cables are connected in an HF-compatible manner, e.g. by using grounding clamps or EMC screw fittings, so that the braided shield has a large connection surface.
- Do not use the cable shield of signal cables for the equipotential bonding.

9.1.4 Cable installation

Observe the following information:

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- Route the power cables, such as the motor cable and the brake cable, separately from the supply system cable and the control cables.
- Route all cables as closely to the reference potential as possible, e.g. the mounting plate.
- Keep all cables as short as possible. Avoid spare loops.

9.1.5 Cable connection

Supply system cable

Observe the following information:

- The supply system cable can be connected using single conductors or unshielded cables.
- Always route filtered and unfiltered cables separately from each other.

Power connection of motor and brake

Observe the following information:

- Lay the braided shield of all cables both on the inverter side and on the motor side over the entire circumference.
- For the shield connection, use the designated shield plates on the inverter side (if provided). In all other cases, use commercially available shield terminals for installing the shielding of motor and brake cables. Apply the shield as closely as possible to the inverter.
- If the motor cable and brake cable are combined in a shared cable, the cable must have an inner shield separating the brake cables from the motor conductors. The cables also possess an overall shield. If the brake cable is routed separately, SEW-EURODRIVE recommends using a shielded brake cable.
- In the event of exceptionally high EMC requirements, an additional connection point for the shield is recommended. To limit the emitted interference, the motor shield can additionally be grounded to the control cabinet outlet using commercial installation materials (grounding clamps or EMC screw fittings).

Control cable

You may make the connection of the control cables (e.g. digital inputs and others) by unshielded single conductors. Shielded cables increase the EMC. Use the designated shield plates to connect the shield.

For routing outside of the control cabinet, you must use shielded cables.

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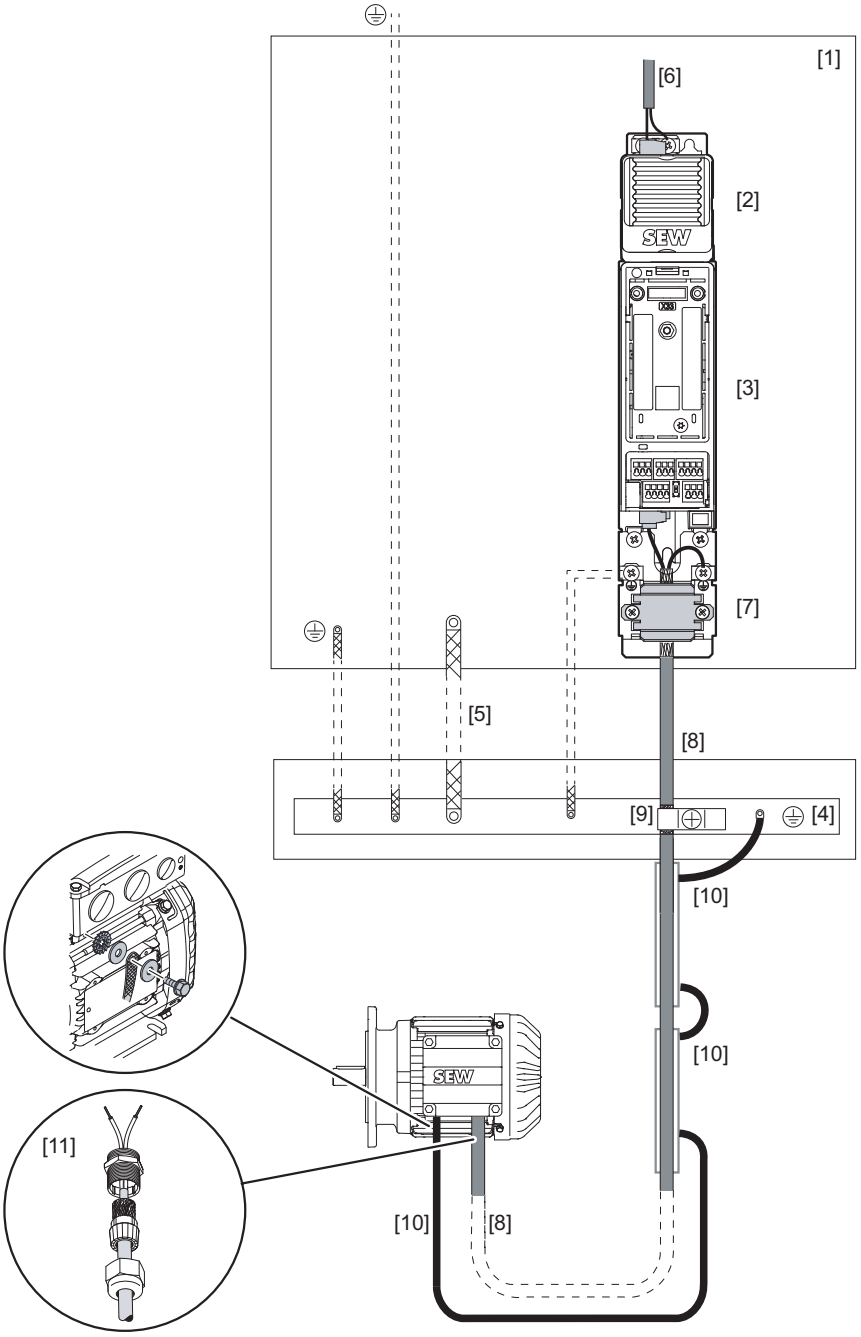
9.1.6 Installation example



9007235268983435

[1] Galvanized mounting plate
[2] Line filter
[3] Inverter
[4] PE busbar
[5] HF connection of PE busbar/mounting plate
[6] Supply system cable
[7] Power shield plate
[8] Motor cable
[9] Grounding clamp
[10] HF connection between conductive cable routings
[11] EMC screw fitting for motor cable

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9.2 Installation instructions

9.2.1 General information

Observe the following information:

- **Before switching on the supply voltage, make sure you read the chapter** "Startup" (→ 🗎 119).
- Provide for suitable measures to prevent the motor from starting up unintentionally. Take additional safety measures depending on the application to prevent possible injuries to people and damage to machinery.
- Only use closed cable lugs or wire ferrules to prevent litz strands from emerging.
- To avoid mechanical vibrations, fasten connected cables by suitable means, e.g. by fixing them on the shield plate or a clamp on the mounting plate of the control cabinet.
- Disconnect the following electrical connections only in a de-energized state: Motor, supply system, braking resistor, brake, encoder, energy storage unit, discharge unit.

9.2.2 Permitted voltage supply systems

Voltage supply systems	Permissibility
TN and TT systems – voltage systems with directly grounded star point	Use is possible without restrictions.
IT systems – voltage systems with non-grounded star point	Use is only permitted with adherence to the following measures: 1. Only deactivate the EMC capacitors when used in IT systems. For further information, refer to chapter "Use in IT systems" (→ 🗎 101). 2. Mark this on the nameplate in the "IT system activated" box provided for this purpose. **INFORMATION:** The EMC limit values for interference emission are not specified for voltage supply systems without grounded star point (IT systems). The effectiveness of line filters is severely limited.
Voltage systems with grounded outer conductor	Use only for nominal line voltages up to max. 240 V.

9.2.3 Use in IT systems

Deactivating the EMC capacitors

Proceed as follows:

1. Disconnect the inverter from the power.
2. Check if the inverter is de-energized.
3. Remove all connectors.
   ⇨ The nameplate is attached to the left side of the inverter (as viewed from the front). A circular marking with the imprint "EMC" is attached to the nameplate.

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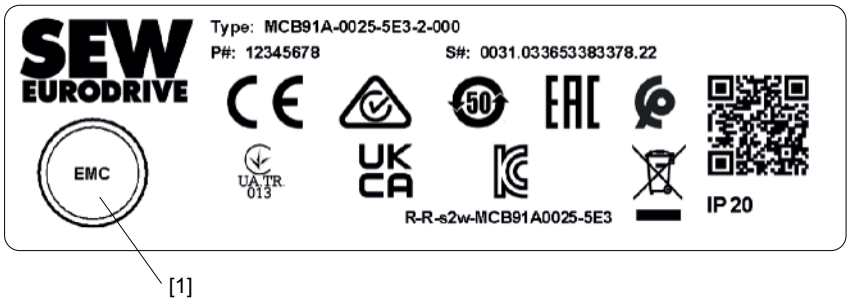

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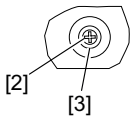
[1] EMC marker

4. Cut out the EMC marker using a suitable tool.
5. Unscrew the accessible screw [2] from the board.
6. Insert the supplied washer [3] under the screw [2] and tighten the screw again.



36894104459

[2] Screw
[3] Washer

9.2.4 Permitted terminal tightening torques

1. **NOTICE!** Failure to adhere to prescribed tightening torques. Damage to the device. Connect the power cables with the specified tightening torques.

Adhere to the specified tightening torques with a tolerance of +/- 10%.

		Tightening torques in Nm
Line connection	X1	0.6
Motor connection	X2	0.6
Terminal screw for TN/IT systems	EMC	1.5
Other screw connections	–	1.5

9.2.5 Permitted terminal cable cross sections

Single conductor, without wire ferrule, rigid and flexible

MOVITRAC® basic	Terminal designation	Terminal type	Stripping length in mm	Cable cross section in mm²			
				Rigid		Flexible	
				Minimum	Maximum	Minimum	Maximum
All inverters	X20	Spring terminal	8.5 – 9.5	0.2	1.5	0.2	1.5
	X22		8.5 – 9.5	0.2	1.5	0.2	1.5
	X23		8.5 – 9.5	0.2	1.5	0.2	1.5
	X1	Screw terminal[1)]	8	0.2	2.5	0.2	2.5
	X2		8	0.2	2.5	0.2	2.5

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MOVITRAC® basic	Terminal designation	Terminal type	Stripping length in mm	Cable cross section in mm²			
				Rigid		Flexible	
				Minimum	Maximum	Minimum	Maximum
Gateway	X5	Spring terminal	10	0.2	2.5	0.2	2.5

1) SEW-EURODRIVE recommends using wire ferrules for installation with screw terminals and a flexible cable.

Single conductor, with wire ferrule, flexible, with or without plastic collar

MOVITRAC® basic	Terminal designation	Terminal type	Stripping length in mm	Cable cross section in mm²			
				Plastic collar			
				with		without	
				Minimum	Maximum	Minimum	Maximum
All inverters	X20	Spring terminal	8.5 – 9.5	0.25	1	0.25	1
	X22		8.5 – 9.5	0.25	1	0.25	1
	X23		8.5 – 9.5	0.25	1	0.25	1
	X1	Screw terminal	8	0.25	2.5	0.25	2.5
	X2		8	0.25	2.5	0.25	2.5
Gateway	X5	Spring terminal	10	0.25	2.5	0.25	2.5

Two-conductor cable, with wire ferrule, flexible, with plastic collar

MOVITRAC® basic	Terminal designation	Terminal type	Stripping length in mm	Two-conductor cable, same cross section in mm², Twin wire ferrule			
				Plastic collar			
				with		without	
				Minimum	Maximum	Minimum	Maximum
All inverters	X1	Screw terminal	8	0.5	1	0.25	1
	X2		8	0.5	1	0.25	1

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9.2.6 Selecting the residual current device

The inverter can cause a direct current in the PE conductor.

Proceed as follows to select the residual current device:

1. If using a residual current device is not mandatory according to the standards, SEW-EURODRIVE recommends not using a residual current device.
2. ⚠ **WARNING!** No protection against electric shock if an incorrect type of residual current device is used. Severe or fatal injuries.
   If a residual current device (residual current device RCD or residual current monitor RCM) is provided, use an all-current-sensitive RCD or RCM of type B.
3. If a residual current device is required, select the residual current device according to the requirements for protecting persons, fire protection or system protection. Observe the tripping characteristic, the deceleration and the rated tripping current of the residual current device during selection.
4. During project planning, note that leakage currents which are as low as possible occur in the system for operational reasons.
5. If the operational leakage currents are too high, you can distribute the current supply among several RCDs.

9.2.7 Using the line contactor

Proceed as follows:

1. Always place the line contactor before the line filter (if present).
2. Use at least one contactor of utilization category AC-3 (EN 60947-4-1) as a line contactor.
3. **NOTICE!** Failing to observe the minimum switch-off time of the line contactor can cause material damage. Irreparable damage to the inverter or unforeseen malfunctions.
   After switching off the voltage supply, keep it switched off for at least 10 s.
   - ⇨ With 3-phase devices, do not switch on the voltage supply more frequently than once every 60 seconds.
   - ⇨ With 1-phase devices, do not switch on the voltage supply more frequently than once every 120 seconds.
4. Do not use the line contactor for jog mode, but only for switching the inverter on and off.

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9.2.8 Information regarding PE connection

A leakage current > 3.5 mA may be generated when operating the inverter. To avoid shock currents according to EN 61800-5-1, observe the following cable cross sections:

- Supply system cable < 10 mm^2:

  Route a second PE conductor with the cable cross section of the supply system cable in parallel to the protective earth via separate terminals or use a copper protective earth conductor with a cable cross section of 10 mm^2.

  If an inverter with a metal backplane is located on a grounded mounting plate, it is not necessary to connect a 2nd PE to the inverter. The connection for grounding the mounting plate must be marked as PE connection.
- If an earth leakage circuit breaker is used for protection against direct and indirect contact, it must be universal current sensitive (RCD type B).

9.2.9 Installation with protective separation

The inverter meets all requirements for protective separation of power and electronics connections according to EN 61800-5-1. The connected signal circuits, including the DC 24 V voltage supply, have to meet the requirements according to SELV (Safety Extra Low Voltage) or PELV (Protective Extra Low Voltage) to ensure protective separation. The installation must meet the requirements for protective separation.

9.2.10 Protection devices

Observe the following information:

- Manufacturer's declaration: The devices are equipped with an integrated protection device against short circuit. The switch-off times of the inverters are max. 100 ms and are therefore well below the switch-off times required by the standards.
- The power contactor of the supply system cable must be realized through external overload devices.
- The relevant standards must be observed concerning the cable cross section, the voltage drop, and the type of routing that is used.

9.3 24 V supply voltage

The maximum permitted length of the 24 V supply cable is 30 m.

The inverters have an internal 24 V voltage supply. The internal 24 V switched-mode power supply has an available power of 6 W.

As soon as a gateway is plugged into an inverter, the gateway must be supported with an external 24 V voltage supply. All other inverters connected to a gateway via a CFC11A communication module are supplied via the gateway and do not require an additional 24 V voltage supply.

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9.4 Temperature evaluation

⚠ WARNING

Dangerous voltages at the terminals of the inverter/power supply module when connecting an unsuitable temperature sensor.

Death or severe injuries due to electric shock.

- To avoid violating the requirements for protective separation, only connect temperature sensors with protective separation to the motor winding to the temperature evaluation.

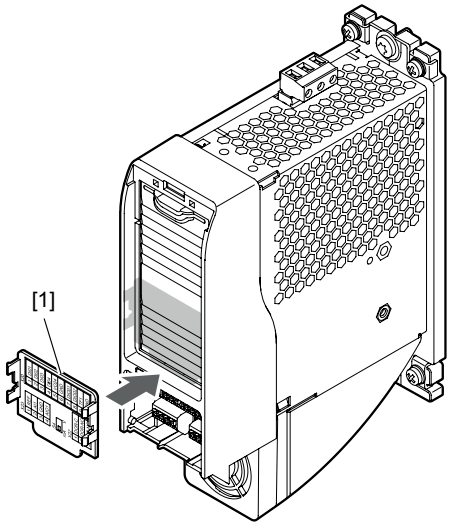
The temperature sensor is connected via the corresponding connections for TF1 and GND.

Observe the following additional notes for group and multi-motor drives:

- Preferably use bimetallic temperature switches TH.
- The series connection of the TH contacts (normally closed) is not subject to any restriction if joint monitoring is provided.
- If the TF temperature sensors are available in motors, the temperature sensors of up to 3 motors can be connected in series.

9.5 Connecting the signal terminals

To simplify the process of connecting signal terminal blocks X20, X22, and X23, the assignment of the signal terminals is provided on the back of the cover [1]. The cover [1] can be removed and inserted into the device with the back facing forward.



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After completing the connection work, the cover [1] must be reattached to protect the connection blocks.

9.6 Inputs/outputs

Observe the following information:

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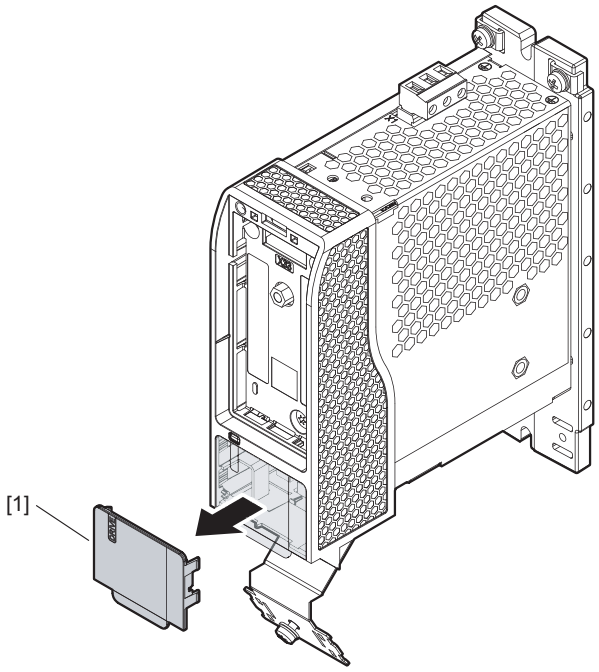
- The digital inputs and outputs are referenced to GND. GND is connected to PE. Incorrectly applied voltages can damage the digital inputs and digital outputs. Do not apply external voltage to the digital outputs.
- Cables outside the control cabinet must be shielded.
- When connecting the shielding, ensure equipotential bonding.
- The cable length must not exceed 30 m.
- Connect the digital inputs and outputs to the appropriate connections.

9.7 Gateways, communication modules, and cable routing

Proceed as follows:

1. Remove the cover [1].



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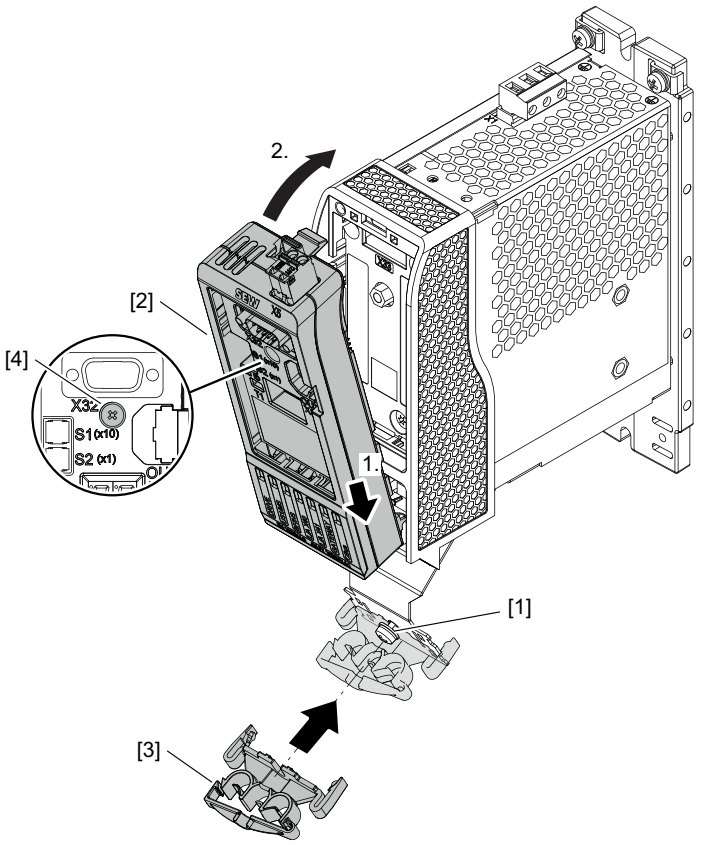
2. Install the gateway [2] on the front of the inverter and tighten the retaining screw [4].



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3. Mount the cable clip [3] on the shield plate as cable routing for the network cables. First, remove the clamping bracket of the shield plate by loosening the screw [1]. The cable clip can then be attached and fastened using the loosened screw.

   ⇨ The gateway has been installed.

4. Connect the network cables.

   ⇨ For fieldbuses: No particular sequence

   ⇨ For EtherCAT®/SBus^{PLUS}: X40 (IN) and X40 (OUT)

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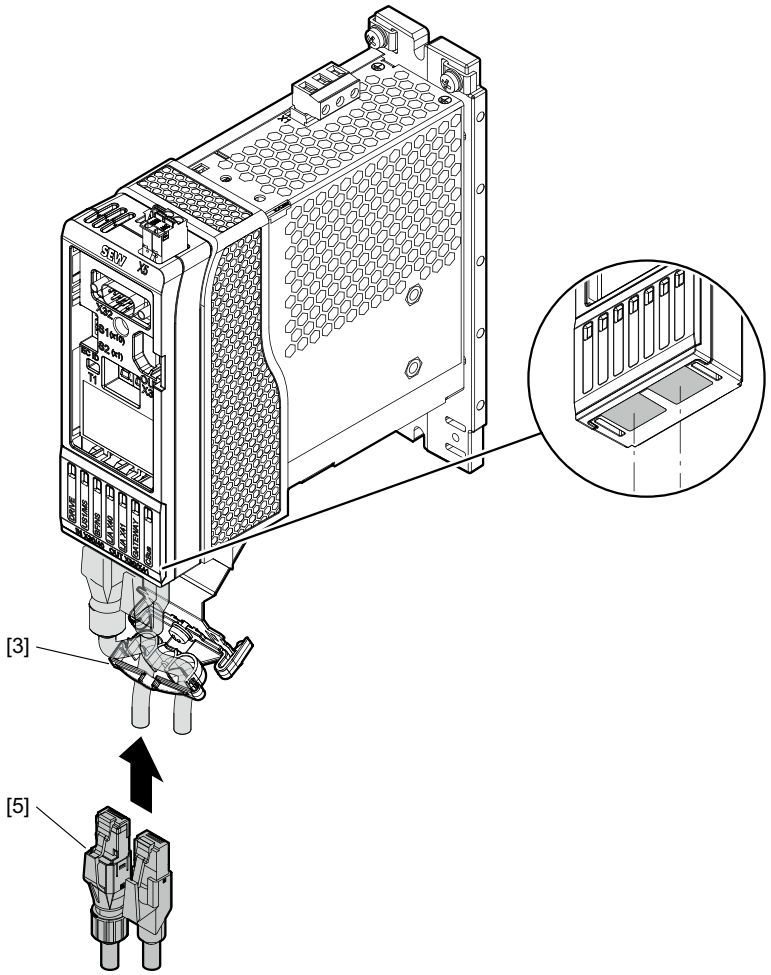
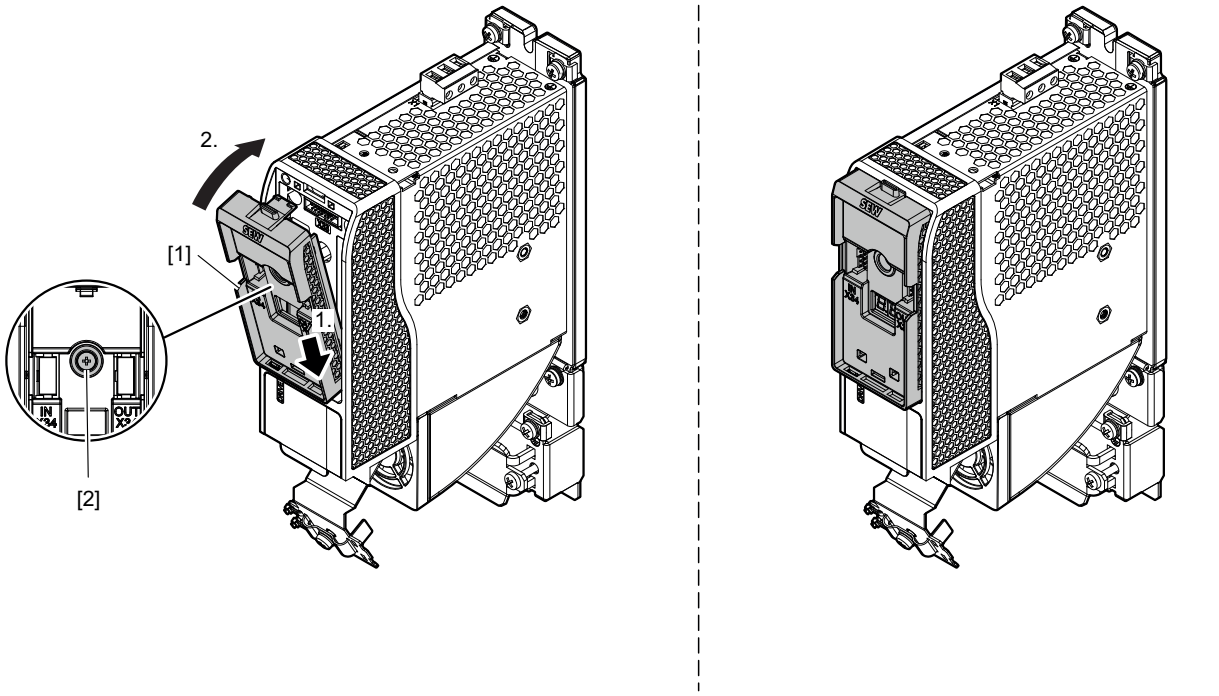
5. To secure the network cables [5], use the cable clip [3].



50359665931

6. Install the communication module [1] on the front of the inverter and tighten the retaining screw [2].



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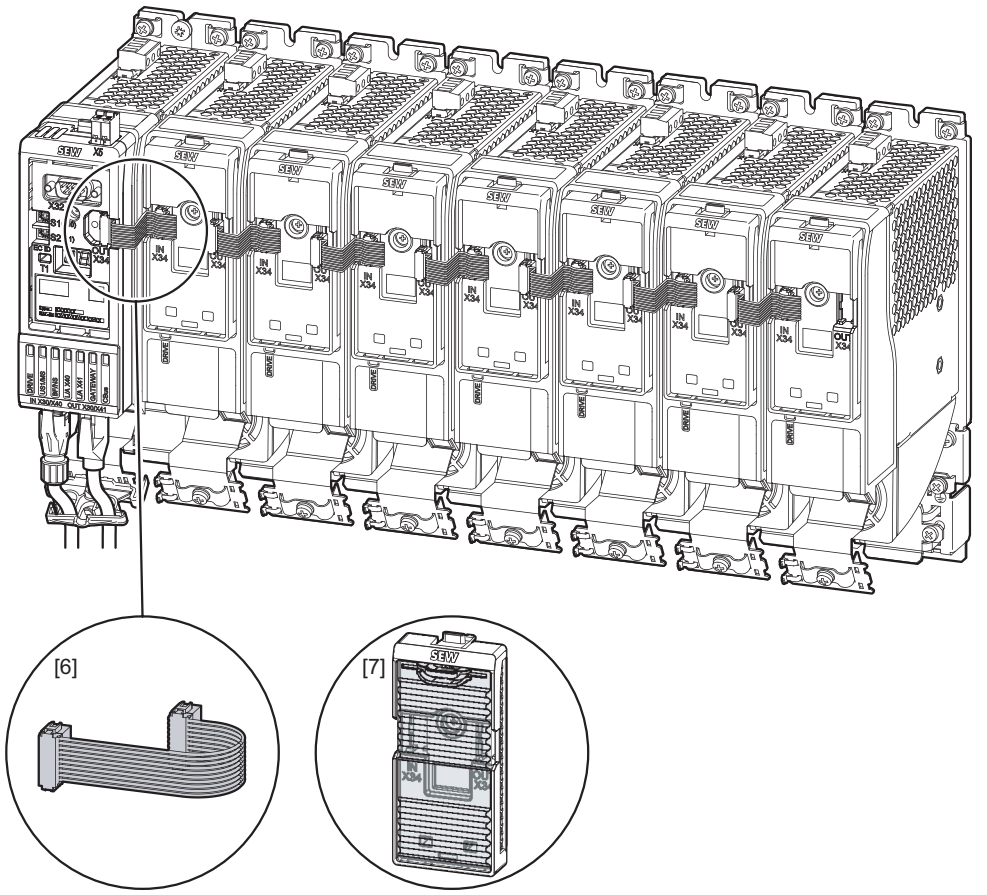
7. Connect the gateway to the communication modules with the supplied ribbon cable [6] and route it as follows:



54572786699

8. Reinstall the transparent front cover [7] for all communication modules.

9.8 CNF.. line filter

Observe the following information:

- No other consumers may be wired between the line filter and the inverter.
- No switching is allowed between the line filter and the inverter.
- The connection cable between the line filter and inverter does not have to be shielded.
- Limit the length of the cable between the line filter and the inverter to the required length.
- Always lay the cables upstream and downstream of the line filter separately.
- **Under no circumstances** should the cables before and after the line filter be routed along the motor cable.

9.9 Terminal assignment

9.9.1 General information

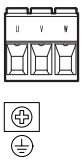
INFORMATION

The device-internal reference potential is designated as GND. All reference potentials GND are internally connected to PE.

The technical data for the power and control electronics connections is provided in the **Product manual** > chapter "Technical data" (→ 🗎 30).

9.9.2 Basic device

MCB91A-....-5D3..

Terminal	Contact	Function	
	X1:L1	L1	Line connection
	X1:L2	L2	
	X1:L3	L3	
	⏚	PE	PE connection
	X2:U	U	Motor connection
	X2:V	V	
	X2:W	W	
	⏚	PE	PE connection

MCB91A-....-2D1..

Terminal	Contact	Function	
	X1:N	N	Line connection
	X1:L1	L1	
	⏚	PE	PE connection
	X2:U	U	Motor connection
	X2:V	V	
	X2:W	W	
	⏚	PE	PE connection

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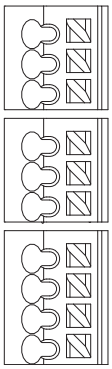
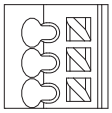
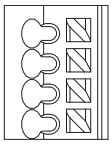
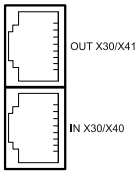
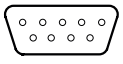
All inverters

Terminal	Contact	Function	
	X20:1	DI01	Digital input 1, FCB 05 – fixed setpoints for positive direction of rotation[1)]
	X20:2	DI02	Digital input 2, FCB 05 – fixed setpoints for negative direction of rotation[1)]
	X20:3	DI03	Digital input 3, fixed speed setpoint bit 0[1)]
	X20:4	DI04	Digital input 4, fixed speed setpoint bit 1[1)]
	X20:5	24V_out	DC 24 V voltage output
	X20:6	GND	Reference potential
	X20:7	DIO01	Digital input/digital output 01 Voltage input, error reset[1)]
	X20:8	DIO02	Digital input/digital output 02 Voltage input, no function[1)]
	X20:9	TF1	Sensor input for temperature evaluation of the motor
	X20:10	GND	Reference potential
	X22:1	DOR-C	Shared relay contact
	X22:2	DOR-NO	NO contact, no function[1)]
	X22:3	DOR-NC	NC contact, no function[1)]
	X23:1	REF10V	+10 V reference voltage output
	X23:2	AI1	Analog input voltage or current Speed setpoint source: 0 to 10 V; 0 to 1500 min^{-1}
	X23:3	GND	Reference potential
	X23:4	AIO1	Analog input/analog output

1) Factory setting

9.9.3 Gateway

Terminal	Contact	Function
	X5:24 V	DC 24 V supply voltage
	X5:GND	Reference potential
	IN X30/X40	- EtherCAT® IN X30/OUT X30 (in preparation) - PROFINET X40/X41 - Ethernet IP / Modbus TCP X40/X41
	OUT X30/X41	
	X32	Interface for CBG21A and service interface for MOVISUITE®
–	X34 OUT	CBus (ribbon cable connection)

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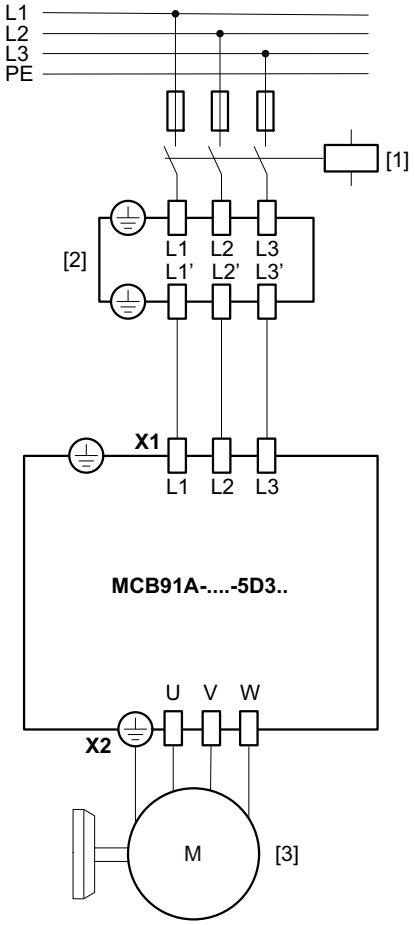
9.10 Wiring diagrams

9.10.1 Power connection

Power connection with 3-phase line contactor



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[1] Line contactor (optional)
[2] Line filter (optional)
[3] Motor

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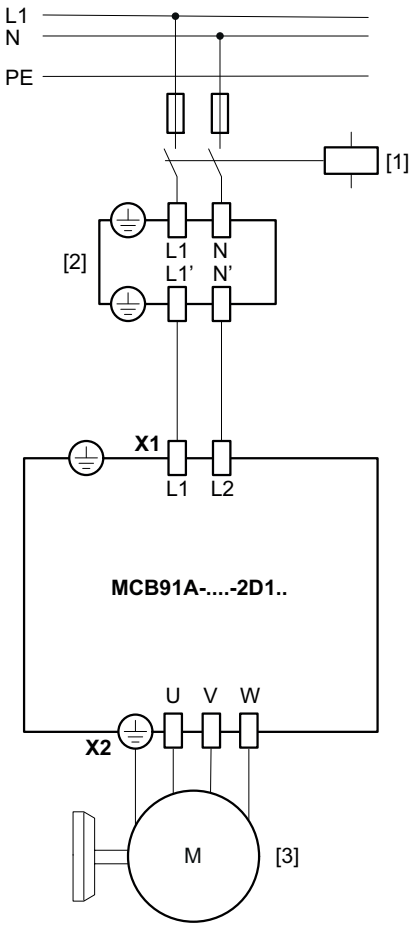
Power connection with 1-phase line contactor



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[1] Line contactor (optional)
[2] Line filter (optional)
[3] Motor

9.10.2 Brake control

The brake is controlled via the integrated isolated relay contact (X22:2 DOR-NO; X22:1 DOR-C) of the inverter.

- The relay contact is automatically parameterized to "brake output" once a motor with a brake in the drive train is configured.
- Connect a DC 24 V control voltage for the brake rectifier directly to relay contact X22.

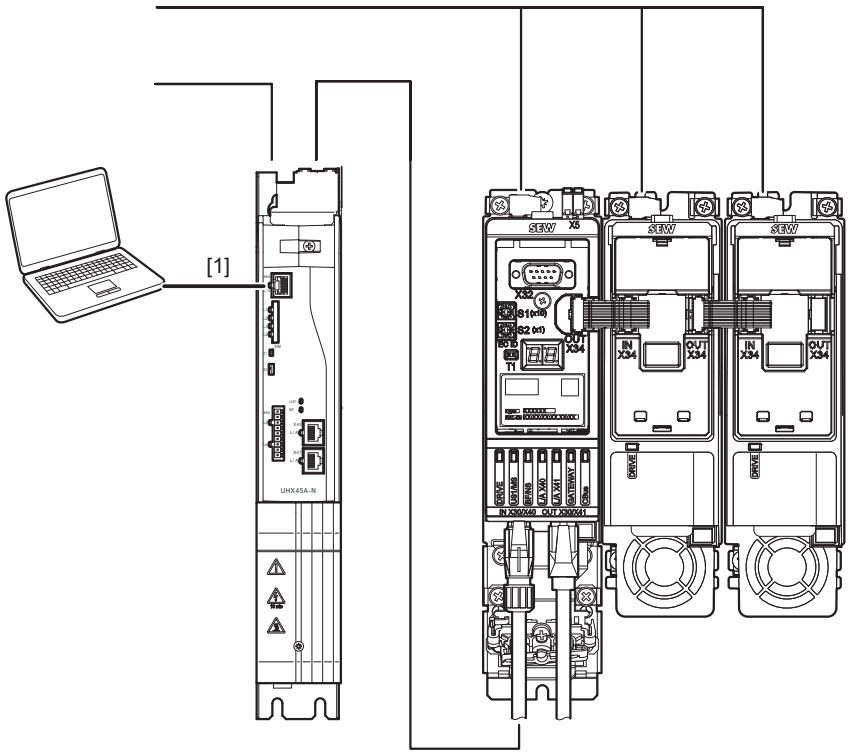
A coupling relay with corresponding voltage endurance is to be used for the low voltage connection. Overvoltages of the coil of the coupling relay are to be suppressed via a freewheeling diode or RC elements.

9.11 PC connection

Observe the information in the **product manual** > chapter "Electrical installation" > "PC connection" including the sub-chapters.

9.11.1 Connection via MOVI-C® CONTROLLER

The following figure shows the connection of inverters to the MOVISUITE® engineering software using a PC:



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[1] Ethernet

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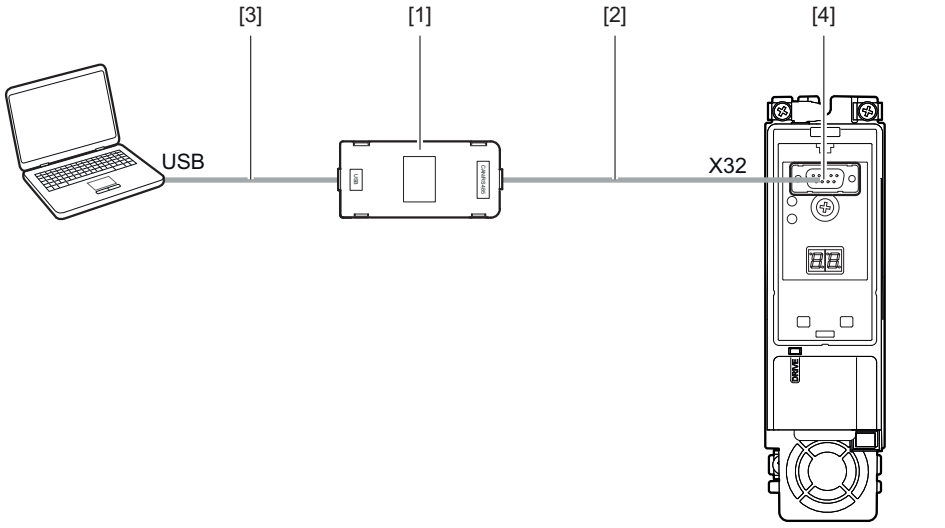
9.11.2 Connection via CDM11A and USM21A

The following figure shows the connection of inverters to the MOVISUITE® engineering software using the CDM11A diagnostic module and the USM21A interface adapter:



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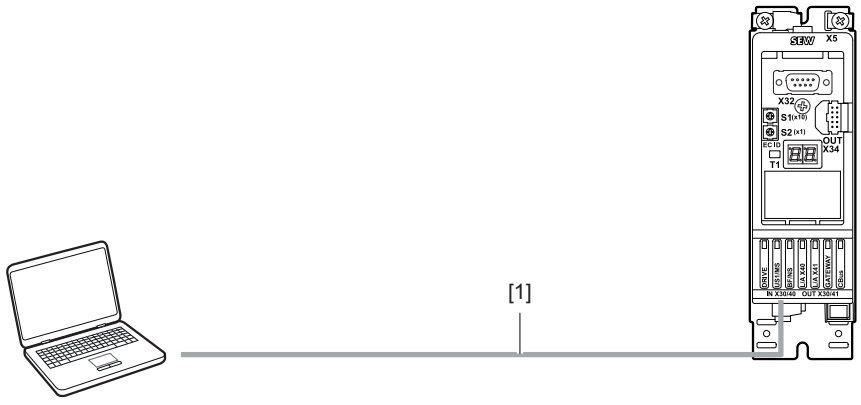
[1] USM21A interface adapter, part number: 28231449
[2] Serial interface cable with an RJ10 connector and a 9-pin D-sub connector, part number 18123864.
This cable is necessary for the connection of the interface adapter to the inverter, and must be ordered separately.
[3] USB connection cable, type USB A-B. The cable is included in the scope of delivery of the interface adapter.
[4] CDM11A diagnostic module

The data is transferred according to the USB 2.0 standard. It is also possible to work with a USB 3.0 device.

9.11.3 Connection via gateway

The following figure shows the connection of inverters to the MOVISUITE® engineering software via gateway:



54576273163

[1] Ethernet cable

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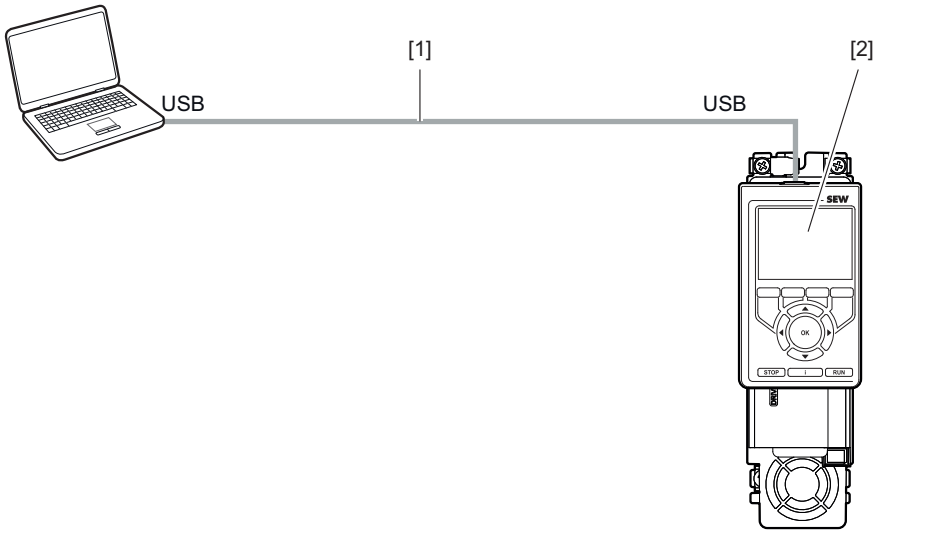
- For a CFX11A-E or CFX11A-N gateway, activate "Ethernet" as communication/ network type.
- For a CFX11A-S gateway, activate "EtherCAT®" as communication/network type.

The inverter can only be scanned if you assign an IP address to the inverter. The assignment takes place via the SEW MOVI-C Address Editor or a third-party addressing tool.

9.11.4 Connection via a keypad

The following figure shows the connection of inverters to the MOVISUITE® engineering software using the CBG11A or CBG21A keypad. The CDM11A diagnostic module is required to connect the keypad.



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[1] USB cable, type USB A-Mini-B, 25643517
[2] Keypad, here by way of example CBG21A, plugged onto CDM11A diagnostic module

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10 Startup

10.1 Startup information

Perform the following steps before startup:

1. ⚠ **WARNING!** Electric shock caused by dangerous voltages. Severe or fatal injuries.
   De-energize the device. Observe the 5 safety rules in chapter "Performing electrical work safely". Then wait at least 10 minutes.
2. ⚠ **WARNING!** Risk of burns due to hot surfaces. Severe injury.
   Let the device and its accessories cool down before touching it.
3. **NOTICE!** Failing to observe the minimum switch-off time of the line contactor can cause material damage. Irreparable damage to the inverter or unforeseen malfunctions.
   After switching off the voltage supply, keep it switched off for at least 10 s.
   ⇨ Do not switch the voltage supply on or off at the line contactor more than once per minute.
4. Install the protective covers of the system according to the instructions. This will avoid injuries.
   ⇨ Never start the device if the protective covers are not installed.
5. With 3-phase devices, do not switch on the voltage supply more frequently than once every 60 seconds.
6. With 1-phase devices, do not switch on the voltage supply more frequently than once every 120 seconds.
7. ⚠ **WARNING!** Danger if the motor starts up unintentionally. Severe or fatal injuries.
   If the control signals are present, the motor can unintentionally automatically start up.
8. Note that the premagnetization of an asynchronous motor without a brake can lead to an alignment process and thus to rotor movement.

10.2 Startup requirements

The following prerequisites are required for startup:

- You have installed the inverter correctly both mechanically and electrically.
- You have configured the inverter and connected drives correctly.
- You have taken suitable measures to ensure that the drives do not start up unintentionally.
- Safety precautions rule out hazards to people and machinery.

If you are using a power-adjusted motor, you can, depending on requirements, dispense with startup, see chapter "Operation without startup" (→ 🗎 120).

Otherwise you can perform startup in the following ways:

- Using a keypad
- Using the MOVISUITE® engineering software

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10.2.1 Required hardware for startup with MOVISUITE®

- USM21A interface adapter, CDM11A diagnostic module and serial interface cable RJ10 → D-sub-9

  or

- CBG11A/CBG21A keypad, CDM11A diagnostic module and USB cable A → Mini B

Part number	Scope of delivery
28231449	• USM21A interface adapter • Serial interface cable with 2 RJ10 connectors • USB cable (A-B)
18123864	• Serial interface cable RJ10 → D-sub -9
25643517	• USB cable (A – mini B)
28265092	• CDM11A diagnostic module
28233646	• CBG11A keypad
28238133	• CBG21A keypad

10.3 Operation without startup

When delivered, the inverter is preset with a "SmartMotor" in the DT1 and DT2 drive trains. The SmartMotor is a motor data set of a power-adjusted 4-pin asynchronous motor; refer to the **product manual**, chapter "Technical data" (→ 🗎 30) "Motor power ASM P_{Mot}" (corresponds to the specification P(ASM) on the inverter's nameplate).

In the MOVISUITE® engineering software and in the CBG11A and CBG21A keypads, this presetting of the drive train is referred to as "SmartDrive".

10.4 Automatic configuration after delivery

Only right after delivery, the inverter is in "brand new" state and offers the option of automated configuration. This state cannot be restored at a later time.

Before the inverter is switched on and supplied with voltage, first install all options that are required for later operation in order to perform the automated configuration.

When the inverter is switched on for the first time, it detects once whether options such as gateways or communication modules are plugged in or not and accordingly loads various configurations in the inverter.

- If no options are mounted on the inverter, the configuration for terminal mode (digital and analog control via terminals) is loaded automatically. The digital inputs and all other terminals are pre-assigned, see chapter "Automatic configuration for terminal mode" (→ 🗎 121).
- If options are mounted on the inverter, the configuration for fieldbus operation or bus operation is loaded automatically. The digital inputs as well as all other terminals and the bus connection are pre-assigned, see chapter "Automatic configuration for gateway operation" (→ 🗎 122).

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If the optional configuration (with or without gateway or communication module) of a device is subsequently changed, the inverter no longer automatically loads the configuration provided for this purpose. To enable subsequent changes, you must select the "Delivery state fieldbus device" or "Delivery state binary device" setting in the basic settings. The inverter loads the corresponding configuration manually, see chapter "Automatic configuration for terminal mode" (→ 🗎 121) or chapter "Automatic configuration for gateway operation" (→ 🗎 122).

10.4.1 Automatic configuration for terminal mode

If the inverter loads the configuration for terminal mode, the following pre-assigned terminal functions are available.

The assignment of the terminals can be changed by the user.

Digital inputs	
DI01	FCB 05 – fixed setpoints, positive direction of rotation
DI02	FCB 05 – fixed setpoints, negative direction of rotation
DI03	Fixed speed setpoint bit 0
DI04	Fixed speed setpoint bit 1

Configurable digital inputs/digital outputs	
DIO01	Error reset (set as input)
DIO02	No function (set as input)

Analog input	
AI1	Analog input voltage or current Speed setpoint source: 0 to 10 V; 0 to 1500 min^{-1}

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10.4.2 Automatic configuration for gateway operation

If the inverter loads the configuration for gateway operation, the following terminal assignment is available.

The assignment of the terminals can be changed by the user.

Digital inputs	
DI01	No function
DI02	No function
DI03	No function
DI04	No function

Configurable digital inputs/digital outputs	
DIO01	Error reset (set as input)
DIO02	No function (set as input)

Digital outputs	
DOR	No function

Analog input and configurable analog input/analog output	
AI1	Input, 0 – 10 V
AIO1	No function (set as input)

In addition, the MOVIKIT® Velocity Drive is loaded onto the inverter, which enables standardized SEW-EURODRIVE control via five process data words.

Furthermore, the source of the setpoints is switched to the standard bus system and all inverters in the lower-level gateway operation are addressed automatically. The terminating resistor is automatically activated on the last CFC11A communication module.

When using a gateway for EtherCAT®/SBUS^{PLUS}, refer to chapter "Setting the EtherCAT® ID" (→ 🗎 124).

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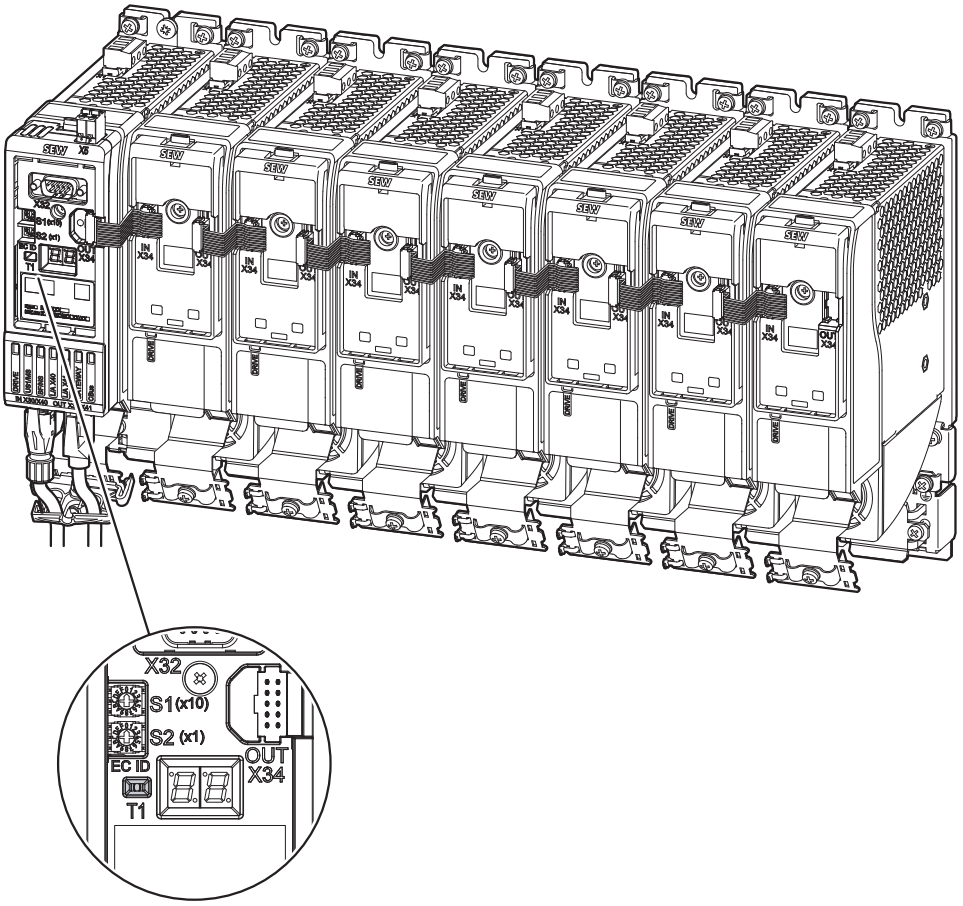
10.4.3 Saving the number of axes found

The gateway automatically addresses all stations (1 – 8) when voltage is applied.

When auto-addressing has been successfully completed, press and hold pushbutton T1 for at least two seconds. The number of axes found is now saved.

If a number of axes has already been saved in the gateway and a different number of stations is detected, the gateway reports fault 33.21. If the pushbutton is pushed again for two seconds while a fault is pending, the fault is reset and the new number of stations is adopted as the target configuration.



54572789899

10.5 Setting the EtherCAT® ID

It is not strictly necessary to set one of the EtherCAT® IDs. The slaves are automatically addressed by the master by default. The EtherCAT® ID must only be set on the inverter if the use of EtherCAT® IDs has been preset in the hardware configuration of the master.

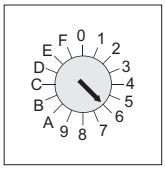
An EtherCAT® ID can be permanently assigned to the inverter with the EtherCAT® interface using hexadecimal switches S1 and S2. With these switches, you can set a decimal EtherCAT® ID between 1 and 255 in hexadecimal notation.

This ID serves as a unique identification tag of the respective EtherCAT® slave for the EtherCAT® master. The EtherCAT® ID is not an EtherCAT® address. The EtherCAT® ID is always assigned by the EtherCAT® master.

In the delivery state of the inverter, the ID is set to 0 by default (S1 = 0 and S2 = 0).

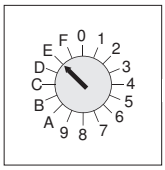
Required ID, decimal	ID, hexadecimal	Setting S1 (× 10)	Setting S2 (× 1)
3	03	0	3
18	12	1	2
25	19	1	9
100	64	6	4
110	6E	6	E
255	FF	F	F

S1-EtherCAT® ID (× 10)



6

S2-EtherCAT® ID (× 1)



E

The EtherCAT® ID "110" is set as an example in the illustration above.

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10.6 Startup with MOVISUITE® engineering software

The inverters are started up using the MOVISUITE® engineering software from SEW-EURODRIVE.

The motor is started up in drive train 1 or drive train 2.

When using a motor from SEW-EURODRIVE, select the motor type from the catalog or enter the nameplate. You can perform the startup for motors and encoders from SEW-EURODRIVE with an electronic nameplate based on the data contained there.

When using a third-party motor, enter the corresponding nominal motor data. SEW-EURODRIVE recommends performing a motor parameter measurement using the FCB 25 for third-party motors.

The engineering software can be operated intuitively and is not described further in this document.

To obtain help or an explanation of parameters, use the F1 help function.

10.7 Startup with the CBG01A keypad

10.7.1 Information

You can start up the following motors with the CBG01A keypad:

- Asynchronous motors:
  - with or without brake
  - with or without motor sensor (TF and TH)

Further information can be found in the "CBG01A keypad" manual.

The startup of other motors can only be performed with the CBG21A keypad or with the MOVISUITE® engineering software.

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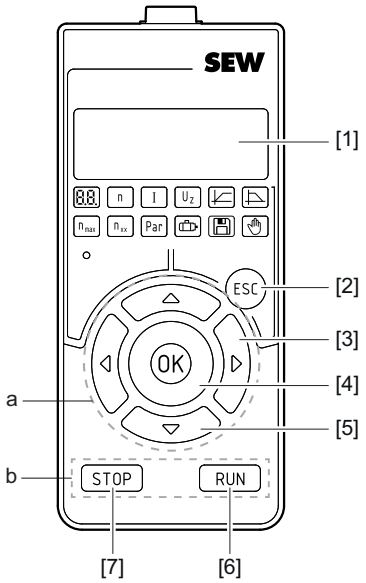
10.7.2 CBG01A keypad

The following figure shows the CBG01A keypad:



9007231988017931

[1] 5-digit, 7-segment display
[2] <Esc> key

a = Navigate in the menu
[3] <Left/right> arrow keys
[4] <OK> key
[5] <Up/down> arrow keys

b = Manual mode control section
[6] <RUN> key
[7] <STOP> key

Selecting a function

Proceed as follows:

1. To open the main menu, press the <Esc> key.
2. Select a function using the <left/right> arrow keys.
3. Confirm your selection with the <OK> key.

Entering a number

Proceed as follows:

1. Change the digit within a number by using the <left/right> arrow keys.
2. Change the value of the digit by using the <up/down> arrow keys.
3. Confirm the number with the <OK> key.

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Symbols used

The selectable functions are shown on the display of the keypad in the form of icons.

	Inverter status, FCB number, fault number
	Actual speed in min^{-1}
	Actual current in A
	DC link voltage in V
	Fixed setpoints – acceleration and application limit – acceleration in $(min \times s)^{-1}$
	Fixed setpoints – deceleration and application limit – deceleration in $(min \times s)^{-1}$
	Application limit – positive speed and application limit – negative speed in min^{-1}
	Fixed setpoints – speed in min^{-1}
	Parameter
	Startup
	Data storage
	Manual mode

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10.7.3 Procedure for motor startup

A universal motor data set with the same performance has already been preloaded in the factory. If better control performance is required or the connected motor deviates from the inverter power, the startup must be carried out and the motor data entered. In the individual steps, you make the following specifications in accordance with the nameplate of the connected motor.

7-segment display	Details	Unit / selection
	Drive train	–
	Nominal motor voltage	V
	Nominal motor current	A
	Frequency	Hz
	Power	kW
	Power factor cos φ	–
	Nominal motor speed	min^{-1}
	Control mode	• V/f[1)] • VFC[PLUS1)] • LVFC[2)]
	Brake	With brake, without brake
	Motor temperature evaluation	TF, TH, no sensor

1) MOVITRAC® advanced and MOVITRAC® classic
2) MOVITRAC® basic

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SEtUP
drivEtrAin
OK
ESC
AttEntion
voLt
400
AMPEr
2.00
hErtZ
50
PowEr
0.00
CoSPh
rPM
1450
ModE
uFC1
brAkE
YES
tEMP-SEnSor
no
CALc
StArt
donE

10.8 Startup with the CBG11A keypad

10.8.1 Information

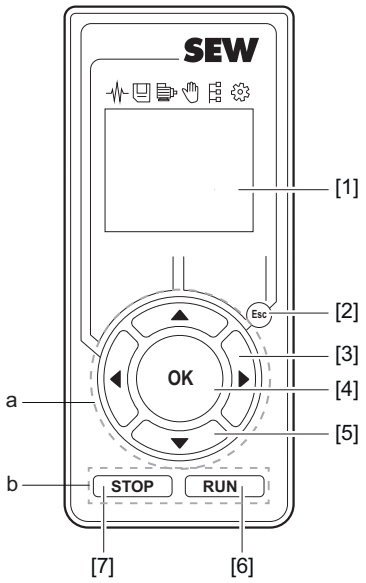
You can start up the following motors with the CBG11A keypad:

- Asynchronous motors:
  - with or without brake
  - with or without motor sensor (TF, TH, KY and PK)

The startup of other motors can only be performed with the CBG21A keypad or with the MOVISUITE® engineering software.

10.8.2 CBG11A keypad

The following figure shows the CBG11A keypad:



18014424428189195

[1] Color display
a = Navigate in the menu
[3] <Left/right> arrow keys
[4] <OK> key
[5] <Up/down> arrow keys
[2] <Esc> key
b = Manual mode control section
[6] <RUN> key
[7] <STOP> key

The user interface of the CBG11A keypad is in English.

Selecting a function

Proceed as follows:

1. To open the main menu, press the <Esc> key.
2. Select a function using the <left/right> arrow keys.
3. Confirm your selection with the <OK> key.

Entering a number

Proceed as follows:

1. Change the digit within a number by using the <left/right> arrow keys.
2. The editable digit is underlined.

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3. Change the value of the digit by using the <up/down> arrow keys.
4. Confirm the number with the <OK> key.

10.8.3 Procedure for motor startup

Proceed as follows:

1. Select the "Startup" icon.
2. Confirm with "OK".
3. Follow the startup procedure.
4. Specify the required data based on the nameplate data of the motor.

10.9 Startup with the CBG21A keypad

10.9.1 Information

You can start up the following motors with the CBG21A keypad:

- Asynchronous motors
- Synchronous motors
- Direct selection of the SEW-EURODRIVE motors

You can carry out the startup of other motors with the MOVISUITE® engineering software.

Further information can be found in the **product manual** > chapter "Startup" > "Startup with the CBG21A keypad", including the sub-chapters.

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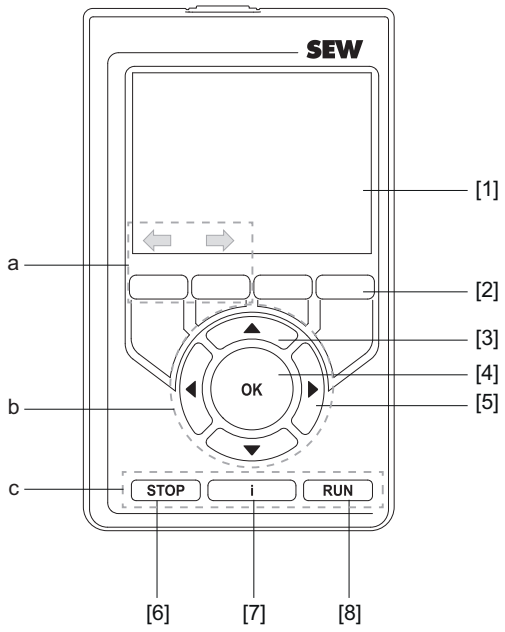
10.9.2 CBG21A keypad

The following figure shows the CBG21A keypad:



9007225148764555

[1] Color display
[2] 4 function keys that are assigned according to the context. The assigned functions are shown in the color display above the keys.

a = Permanently assigned with Back/Next

b = Navigate in the menu		**c = Manual mode control section**	
[3]	<Up/down> arrow keys	[6]	<STOP> key
[4]	<OK> key	[7]	<I> information key
[5]	<Left/right> arrow keys	[8]	<RUN> key

The user interface of the CBG21A keypad is multilingual.

Activating a field

Proceed as follows:

1. Select a field using the <up/down> arrow keys.
2. Activate the field with the <OK> key.

Entering a number

Proceed as follows:

- Change the digit within a number by using the <left/right> arrow keys.
- The editable digit is highlighted.
- Change the value of the digit by using the <up/down> arrow keys.
- Confirm the number with the <OK> key.

10.10 Startup of third-party motors

Asynchronous motors

The nameplate data of the motor must be entered during startup:

- Nominal motor speed

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- Nominal motor frequency
- Nominal motor voltage
- Nominal motor current
- Power factor cos φ
- Nominal motor power

The parameters required for startup are calculated based on the nameplate data and the motor is taken into operation.

SEW-EURODRIVE also recommends carrying out a parameter measurement with FCB25 for better control characteristics. These determine the equivalent wiring diagram of the motor. The duration of the measurement depends on the motor parameters. In the case of asynchronous motors, the measurement is carried out in an idle state. If a brake is present, it remains closed.

10.11 Control options

The following description requires the use of the MOVISUITE® engineering software.

Depending on the design, the inverter is controlled via the digital or analog inputs or via fieldbus.

In principle, the user is free to configure the respective interface individually or use the standard interface of SEW-EURODRIVE. Various MOVIKIT® software modules are available for this purpose.

MOVIKIT® software modules have the following advantages:

- Application-specific functionalities
- Standard interface of SEW-EURODRIVE
- Automated parameterization of the interface
- MOVIKIT®-specific diagnostics and manual operation

10.11.1 Control via terminals

For more information, refer to chapter "Automatic configuration for terminal mode" (→ 🗎 121).

10.11.2 Control via fieldbus

For more information, refer to chapter "Automatic configuration for gateway operation" (→ 🗎 122).

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10.12 Application-related startup

The applications are started up with specific settings using the MOVISUITE® engineering software.

Pay attention to the information in the **Product manual** > chapter "Startup" > "Application-related startup", including the sub-chapters.

10.12.1 3-wire control

3-wire control is a control method for operation with pushbuttons. The enable is edge-controlled via the direction of rotation selection. If you activate the positive and negative direction of rotation at the same time or if you remove the enable stop signal, FCB 13 (application stop) stops. The speed setpoint source can be selected as required.

Parameterization example

In the following parameterization example, the analog input is used as setpoint source.

Description	Index	Function	Comment
Basic settings/ Setpoint source	8366.4	No source	
Setpoints/speed	8376.11	Fixed speed setpoints	
Fixed setpoints/operating mode	8354.20	Unipolar/fixed setpoint	
Fixed setpoints/analog setpoint source	8354.25	Analog input 1	Observe scaling
Acceleration	8377.1	Selection of the source	Default setting: Application limit
Deceleration (FCB13)	8357.13	Entry in user units	
Stop by setpoint function (FCB 05)	8570.1		This parameter should be activated for encoderless systems
Stop setpoint	8570.2	Entry in user units	
Start offset	8570.3	Entry in user units	

Setting the digital inputs

Description	Index	Function	Comment
Digital input 1	8334.11	3-wire control – positive direction of rotation	Pushbutton, NO contact
Digital input 2	8334.12	3-wire control – enable/stop (FCB13)	Pushbutton, NC contact
Digital input 3	8334.13	3-wire control – negative direction of rotation	Pushbutton, NO contact
Digital input 4	8334.14	Reset	Pushbutton, NO contact

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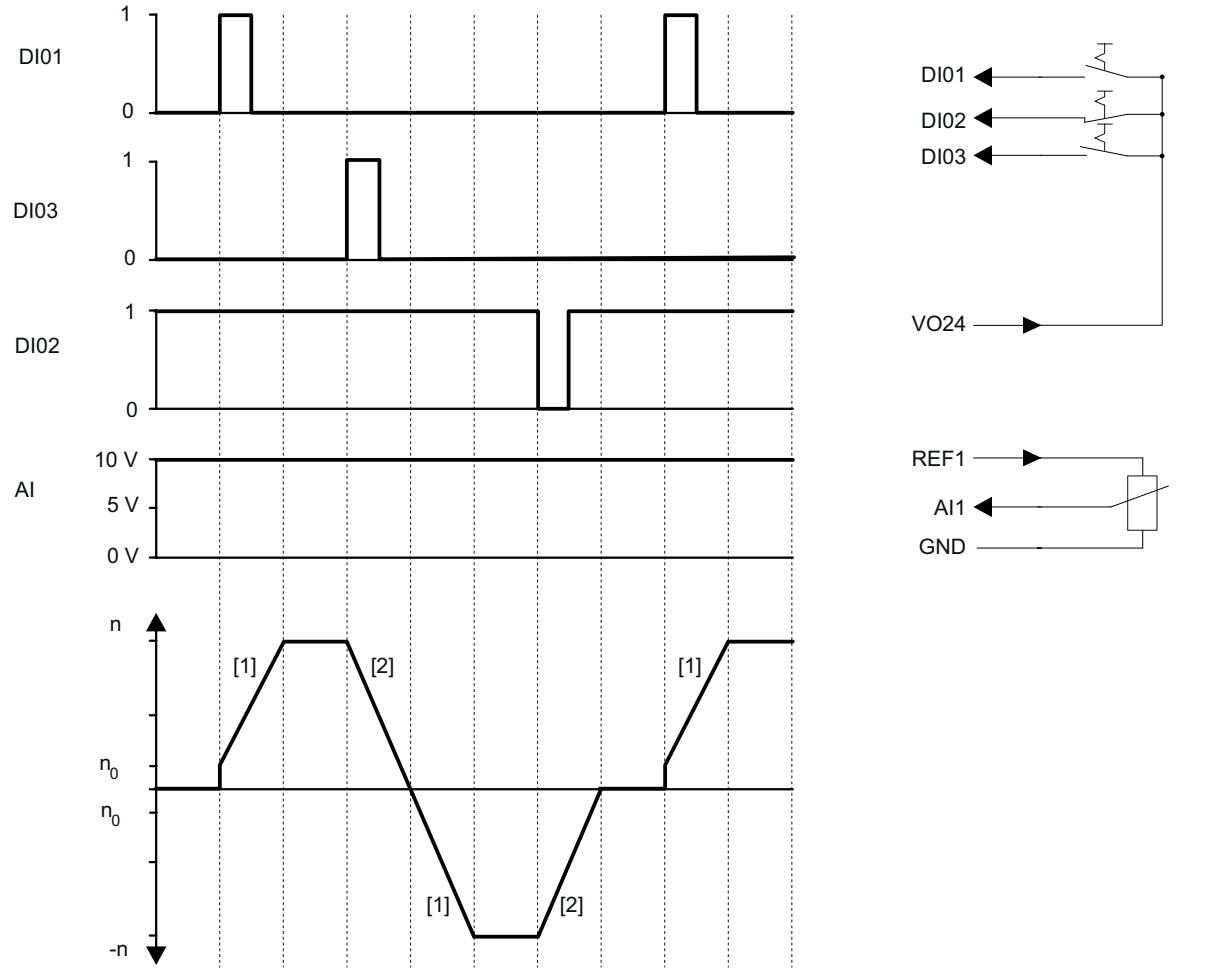
Cycle diagram



9007250051243147

[1] Acceleration according to the source
[2] Application limit deceleration (FCB 13)
DI01 3-wire control – positive direction of rotation
DI02 3-wire control – enable/stop
DI03 3-wire control – negative direction of rotation
AI Analog input setpoint
n Motor speed
n_0 Start/stop speed

10.12.2 "Motor potentiometer" function

The motor potentiometer function lets the inverter respond to signal levels.

If the digital inputs "motor potentiometer up/down" are activated, the speed changes with the profile value "max. acceleration" (index 8377.21) or "max. deceleration" (index 8377.31).

The last motor potentiometer setpoint is retained even when the supply system is switched off if the "save setpoint" function is activated via index 8369.2.

If the digital inputs "motor potentiometer up/down" are activated simultaneously, there are two options:

- Save setpoint (index 8369.2): OFF:

– The inverter stops along the "max. deceleration" (index 8377.31)

- Save setpoint (index 8369.2): ON:
  – The current speed is maintained.

If none of the two inputs are activated, the current speed and direction of rotation are maintained.

Parameter setting example for DT1

Description	Index	Function	Comment
Basic settings/ setpoint source	8366.4	No source	–
Setpoints/speed	8376.11	Fixed setpoints – speed	–
Fixed setpoints/operating mode	8354.20	Motor potentiometer/fixed setpoint	–
Fixed setpoints/analog setpoint source	8354.25	No source	–
Setpoints/ maximum acceleration	8377.21	Selection of the source	Default setting: Application limit
Setpoints/ maximum deceleration	8377.31	Selection of the source	Default setting: Application limit
Minimum speed	8357.18	Limitation of minimum speed	–
Save setpoint	8369.2	Off	Behavior after "power off"

10.12.3 Prioritized terminal control

Description

The "Prioritized terminal control" function is a control function that prioritizes control of the drive independently of the parameterized control signal source (e.g. fieldbus) via digital inputs.

Functions

The following table describes the functions of the prioritized terminal control:

Signal at digital input	Description
Prioritized terminal control – **activation**	This signal activates the prioritized terminal control. During activation, the inverter performs a fault reset once. The drive only starts in combination with a selected direction of rotation (signal "positive direction of rotation" or "negative direction of rotation").

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Signal at digital input	Description
Prioritized terminal control – **positive direction of rotation**	• **Signal level**[1)] If you set the "positive direction of rotation" signal when the prioritized terminal control is activated, the drive starts at speed 1 in positive direction of rotation. If the "positive direction of rotation" and "negative direction of rotation" signals are set at the same time, the drive decelerates to an idle state. • **Positive signal edge (edge-controlled)** The "activation" signal must be set before the direction of rotation is selected. A positive edge of the "positive direction of rotation" signal starts the drive in positive direction of rotation at speed 1. – After a power off or STO, the drive only starts when the device is ready for operation, the "activation" signal is set and a positive signal edge of the "positive direction of rotation" signal (0 → 1) is generated. – If the "positive direction of rotation" and "negative direction of rotation" signals are set at the same time, the earlier edge defines the direction of rotation.
Prioritized terminal control – **negative direction of rotation**	• **Signal level** If you set the "negative direction of rotation" signal when the prioritized terminal control is activated, the drive starts in negative direction of rotation at speed 1. If the "positive direction of rotation" and "negative direction of rotation" signals are set at the same time, the drive decelerates to an idle state. • **Positive signal edge (edge-controlled)** The "activation" signal must be set before the direction of rotation is selected. A positive edge of the "negative direction of rotation" signal starts the drive in negative direction of rotation at speed 1. – After a power off or STO, the drive only starts when the device is ready for operation, the "activation" signal is set and a positive signal edge of the "negative direction of rotation" signal (0 → 1) is generated. – If the "positive direction of rotation" and "negative direction of rotation" signals are set at the same time, the earlier edge defines the direction of rotation.
Prioritized terminal control – **speed 2** (optional)	If the signals for "activation" and "direction of rotation .." are set, the "speed 2" signal activates speed 2 of the drive.
Fault reset (optional)	You can reset faults with the "fault reset" signal. **NOTICE!** Device faults that are caused by a hardware defect, for example, may not be reset. This causes the drive to stop in the fault state. Take this behavior into account in the risk assessment of the system.

1) Select the edge detection "signal level" or "positive signal edge" in the basic settings.

Observe the following information:

- You control the functions of the prioritized terminal control via the signals at the digital inputs.
- When the prioritized terminal control is activated, the inverter resets the present fault once (fault reset).
- Further digital inputs (e.g. from limit switches or external faults) are still evaluated.

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- If several digital inputs are assigned the same function (e.g. "Positive direction of rotation"), the signals are linked with OR.
- Unused functions are assigned level 0 and are therefore not active.

Check whether the inverter has enough free digital inputs for the functions of the prioritized terminal control.

At least 2 digital inputs are required for the prioritized terminal control:

- "Prioritized terminal control – activation" (= "Activation")

  and the

- "Prioritized terminal control – positive direction of rotation" (= "Positive direction of rotation")

  or

- "Prioritized terminal control – negative direction of rotation" (= "Negative direction of rotation")

You can optionally use an additional digital input for the fault reset and/or speed 2.

Parameters, setpoints

The following parameters and setpoints for the prioritized terminal control can be found in the MOVISUITE® engineering software > "Functions" > "Setpoints" > "Prioritized terminal control".

Basic settings

- "Edge detection after STO (if present) and power ON"

  The control signals at the digital inputs must always be present.

  Selection:

  – "Signal level"

    The function starts whenever the input signals are set or are already present.

  – "Positive signal edge (edge-controlled)"

    The function only starts

    - after resetting STO (if present) or

    - after switching on the line voltage (power on) or

    - after switching from 24 V backup mode to line operation (power on)

    - when a positive edge of the "positive direction of rotation" or "negative direction of rotation" signal (0 → 1) occurs.

Status

- "Prioritized terminal control – activation"
- "Prioritized terminal control – positive direction of rotation"
- "Prioritized terminal control – negative direction of rotation"
- "Prioritized terminal control – speed 2"

Speed

- "Speed 1 DT1"
- "Speed 2 DT1"
- "Speed 1 DT2"
- "Speed 2 DT2"

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Acceleration/deceleration

- "Acceleration/deceleration DT1"
- "Acceleration/deceleration DT2"

Operating principle

For prioritized terminal control, the controller uses FCB 04 function block (= manual mode). This function block can only be overwritten by a higher-level FCB (e.g., FCB 01, FCB 14, FCB 13, ..).

Activation

If you set the "Activation" signal, the prioritized terminal control is activated.

- The previous setpoint inputs (e.g. from MOVIKIT®, fieldbus control, basic device functions, …) are deactivated.
- The inverter resets present faults once (e.g. fieldbus fault, etc.).
- The drive is not enabled.
- The output stage is inhibited.
- Display: **FCB 01**

Starting the drive

If you set the "positive direction of rotation" or "negative direction of rotation" signal, the drive is started.

- The drive is enabled in the selected direction of rotation.
- The drive accelerates up to speed 1 of the selected drive train (DT). The "Acceleration DT1" or "Acceleration DT2" parameter specifies the acceleration.
- Display: **FCB 04**

Speed 2

If you set the "Speed 2" signal, speed 2 is activated.

- The drive accelerates up to speed 2 of the selected drive train (DT). The "Acceleration DT1" or "Acceleration DT2" parameter specifies the acceleration.
- Display: **FCB 04**

Status display

The status of the prioritized terminal control (e.g., message "Prioritized terminal control active" or group message "Manual mode/prioritized terminal control active") can be output as follows:

- Via a binary output
- Via a relay
- Via a status word bit
- Via a message bit
- Via the visual 7-segment display
- Via the "DRIVE" LED

  For devices without a 7-segment display, the "DRIVE" LED flashes green with a frequency of 1 Hz (= manual mode/prioritized terminal control).

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Stopping the drive

If **none of the signals** "Positive direction of rotation" and "Negative direction of rotation" is set, the drive is stopped.

- The drive decelerates until standstill.
- The output stage of the inverter is inhibited.
- Display: **FCB 01**

INFORMATION

If **none of the signals** "Positive direction of rotation" and "Negative direction of rotation" is set, the drive is stopped and remains energized.

- The drive decelerates until standstill.
- The drive remains energized.
- The output stage of the inverter is not inhibited.
- Display: **FCB 04**

Deactivation

⚠ WARNING

Danger due to unexpected startup. If you deactivate the prioritized terminal control, the drive is immediately controlled by the original control source. Depending on the settings of the original control source, the drive may restart unexpectedly.

Severe or fatal injuries.

- Check the parameters and signals of the original control source before deactivating.
- Make sure that the settings of the parameters and signals of the original control source do not pose any risks.

If you reset the "Activation" signal, the prioritized terminal control is deactivated.

- The inverter no longer responds to the signals at the digital inputs of the prioritized terminal control.
- The inverter only responds to the parameters and signals of the original control source (e.g. fieldbus signals, other inverter functions, etc.).

10.12.4 Scaling of analog inputs and analog outputs

With the MOVISUITE® engineering software, the analog inputs and analog outputs can be scaled based on your entries.

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11 Operation

11.1 Manual mode with the CBG01A, CBG11A and CBG21A keypads

To start the manual mode, select the corresponding "Manual mode" icon and start it.

11.2 Manual mode with the CBG22A local keypad

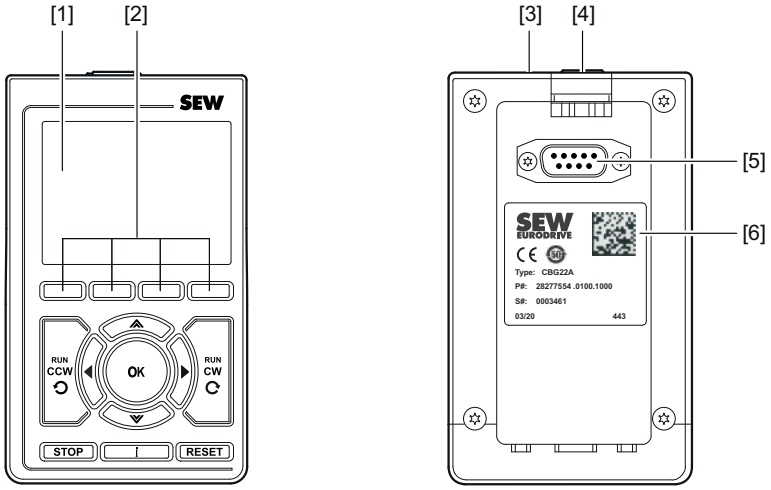
With the CBG22A local keypad, you can intuitively operate the drive unit or device and read out faults using the symbols and functions on the color display.

Further information can be found in the **product manual** > chapter "Operation" > "Manual mode with the CBG22A local keypad", including the sub-chapters.

To start manual operation, the local keypad should be mounted remotely from the inverter. The key switch activates manual mode in the local keypad, see **Product manual** > chapter "Mounting the CBG22A local keypad" (→ 96).

11.2.1 CBG22A local keypad

The following figure shows the front and rear of the CBG22A local keypad:



9007233260681483

[1] Color display
[2] 4 function keys that are assigned according to the context. The assigned functions are shown in the color display above the keys.
[3] USB 2.0 Mini-B interface, female (PC connection)
[4] Locking element
[5] D-sub interface, 9-pin, female
[6] Nameplate

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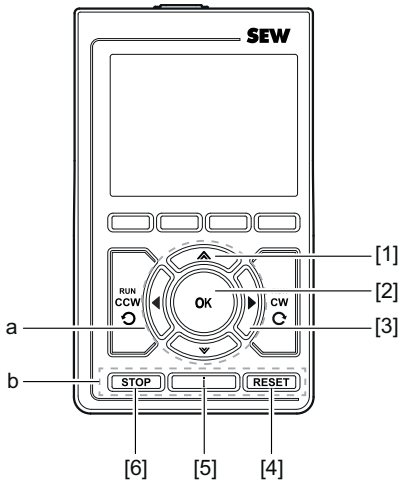
Keys

The following figure shows the keys of the CBG22A local keypad:



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a = Navigate in the menu

[1] <Up/down> arrow keys
[2] <OK> key
[3] <Left/right> arrow keys

b = Manual mode control section

[4] <RESET> key
[5] <i> Information key
[6] <STOP> key

Activating a field

Proceed as follows:

1. Select a field using the <up/down> arrow keys.
2. Activate the field with the <OK> key.

Entering a number

Proceed as follows:

- Change the digit within a number by using the <left/right> arrow keys.
- The editable digit is highlighted.
- Change the value of the digit by using the <up/down> arrow keys.
- Confirm the number with the <OK> key.

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11.3 IT security

11.3.1 Hardening measures

Perform the following hardening measures:

- Regularly check if updates are available for your products.
- Report incidents concerning IT security by e-mail to cert@sew-eurodrive.com.
- Regularly check which Security Advisories are available in the Online Support of SEW-EURODRIVE.
- Evaluate the fault memories and diagnostics information of your products regularly and check whether there are entries that affect IT security.

11.3.2 Guidelines for secure operation

The engineering protocol from SEW-EURODRIVE allows authorized personnel to activate various service accesses on the device. Authentication is implemented by using static access data. This data is not used to defend against attacks on IT security but to protect against unintentional modification. This is the reason why it cannot be changed.

To prevent misuse of these service accesses, network access must be restricted according to the state of the art. For more information, refer to section "IT security of the environment" (→ 🗎 12).

11.3.3 Guidelines for user account management

The device has no user accounts.

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12 Service

12.1 Resetting fault messages

⚠ WARNING

Removing the source of the malfunction or performing a reset can result in an automatic restart of the connected drives.

Severe or fatal injuries.

- Prevent the system from performing an unintentional startup.

Acknowledge the fault message by:

- Switching the device off and on again.
- Send "Reset command" via the controller or PLC.

12.2 Error responses

The following table describes the following fault responses:

Error response	Description
No response	The inverter ignores the event
Warning with self reset	The inverter issues a warning message with self-reset. The fault is automatically reset after the cause of fault is eliminated.
Warning	The inverter issues a warning message.
Application stop (with output stage inhibit)	The inverter stops with the deceleration set for the application limit. Parameter set 1 Index 8375.0-13 Parameter set 2 Index 8375.8-13 If n = 0: Brake "applied" and output stage "off".
Application stop (with output stage inhibit) with self-reset	
Emergency stop (with output stage inhibit)	The inverter stops with the set emergency stop deceleration. Parameter set 1 Index 8375.0-20 Parameter set 2 Index 8375.8-20
Emergency stop (with output stage inhibit) with self-reset	
Inhibit output stage with self-reset	The output stage is deactivated and the brake is applied.
Inhibit output stage	

Self-reset means: Eliminating the cause of the fault results in acknowledgment of the fault. The inverter automatically resumes the operation before the fault occurred. The drive can restart automatically.

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12.3 Fault messages with parameterizable response

Parameterizable errors	Description	Index no.	Possible error response
Manual mode – timeout response	This parameter is used to set the response to a bus timeout during manual mode.	8504.3	• Application stop (with output stage inhibit) • Emergency stop (with output stage inhibit) • Inhibit output stage
Line phase failure	Here you can set the device response to a line phase failure (values below threshold defined by the user, index 8351.5).	8622.4	• No response • Warning • Application stop (with output stage inhibit) • Emergency stop (with output stage inhibit) • Inhibit output stage.
External fault	Here you can set the device response to an external fault (e.g. triggered by terminal or control word).	8622.5	• No response • Warning • Application stop (with output stage inhibit) • Emergency stop (with output stage inhibit) • Inhibit output stage.
Process data timeout	Here you can set the device response to a process data timeout (timeout time, index 8600.3).	8622.6	• Warning • Application stop (with output stage inhibit) • Emergency stop (with output stage inhibit) • Inhibit output stage. • Warning with self reset • Application stop (with output stage inhibit) with self-reset • Emergency stop (with output stage inhibit) with self-reset • Inhibit output stage with self-reset
HW limit switches – current parameter set		8622.11	• No response • Emergency stop (with output stage inhibit) • Emergency stop (with output stage inhibit) with self-reset

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Parameterizable errors	Description	Index no.	Possible error response
Application heartbeat timeout	Here you can set the device response to a timeout of the application heartbeat.	8622.21	• Warning • Application stop (with output stage inhibit) • Emergency stop (with output stage inhibit) • Inhibit output stage.
User-timeout timeout	Here you can set the device response to a timeout of the user timeout function.	8622.22	• Warning • Application stop (with output stage inhibit) • Emergency stop (with output stage inhibit) • Inhibit output stage. • Warning with self reset • Application stop (with output stage inhibit) with self-reset • Emergency stop (with output stage inhibit) with self-reset • Inhibit output stage with self-reset
Undershooting of 4 mA limit at analog input	Here you can set the device response to undershooting the 4 mA limit at the analog input.	8622.25	• Application stop (with output stage inhibit) • Emergency stop (with output stage inhibit) • Inhibit output stage. • Warning with self reset

12.4 Responses to error acknowledgement

12.4.1 Error acknowledgement

When acknowledging an error, the error end state determines which reset type (system restart or warm start) is executed.

12.5 Status and operating displays of the 7-segment display

12.5.1 Description

INFORMATION

The 7-segment display is only available when the CDM11A diagnostic module is used.

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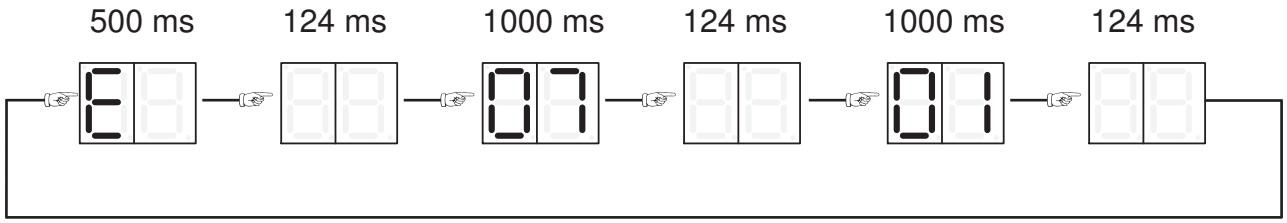
- The two 7-segment displays indicate the operating state of the inverter.

12.5.2 Error displays of the 7-segment display (CDM11A required)

The inverter detects any errors that occur and displays them as an error code. Each error is clearly defined by its error code and the associated attributes:

- Error response
- The final status after executing the fault response
- Type of reset response

The error codes are displayed as flashing numerical values in the inverter display. The error code appears in the following display sequence:



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In the example shown, a two-digit fault code with suberror is displayed (error 07.01).

12.6 Status and operating displays of the LEDs

The positions of the LEDs can be found in the **Product manual** > chapter "Device structure" (→ 🗎 80).

12.6.1 Overview of the LEDs

The device label depends on the device variant or function. Consequently, not all LEDs are labeled for all device variants. The following labeling shows the maximum expansion of the respective variant.

PROFINET IO, EtherNet/IP™, Modbus TCP	SBus^{PLUS}/ EtherCAT®	Binary control
DRIVE	DRIVE	DRIVE
US1/MS	RUN	–
BF/NS	ERR	–
L/A X40	L/A IN	–
L/A X41	L/A OUT	–
Gateway	Gateway	–
CBus	CBus	–

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12.6.2 General LEDs

"DRIVE" LED

The following frequencies always refer to a certain period duration, i.e. a phase-in and phase-out of the LED and not to the entire pattern. For states in which the LED lights up in multiple colors, the following pattern is used:

Color 1 → off → color 1 → off → color 2 → off → color 2 → off = 4 periods

LED	Operating state	Meaning	Measure
Off	Not ready for operation	The supply and/or backup voltage is not connected.	Enable voltage
Yellow **Flashing, 4 Hz**	Not ready for operation	Initialization phase/system startup	Wait until the procedure is complete.
Yellow **Pulse** **250 ms on, 5 s off**	Not ready for operation	The inverter is in standby mode.	Exit standby mode.
Red **Flashing, 1 Hz**	Not ready for operation	An error has occurred, the cause of which can be eliminated by the user.	Refer to chapter "Basic device error description" for possible measures.
Red **Steady light**	Not ready for operation	An error has occurred, the cause of which cannot be eliminated by the user.	Refer to chapter "Basic device error description" for information on how to proceed further.
Yellow/red **Flashing with changing colors, 0.5 Hz** (2 × yellow, 2 × red)	Ready	A warning is present. The output stage is inhibited.	Refer to chapter "Basic device error description" for possible measures.
Green/red **Flashing with changing colors, 0.5 Hz** (2 × green, 2 × red)	Ready	A warning is present. The output stage is enabled.	Refer to chapter "Basic device error description" for possible measures.
Green/yellow **Flashing with changing colors, 4 Hz** (2 × green, 2 × yellow)	Not ready for operation	Automatic startup is being performed via the MOVILINK® DDI interface.	Wait until startup is complete.
Yellow **Flashing, 0.5 Hz**	Not ready for operation	The system is not ready for operation.	Check the cause why "not ready" was issued using the MOVISUITE® engineering software, via the keypad or the controller.
Yellow **Flashing, 1 Hz**	Ready State of manual mode/local mode/ prioritized terminal control	The device is ready for operation, waiting for enable.	–

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LED	Operating state	Meaning	Measure
Green **Flashing, 1 Hz**	Device enabled State of manual mode/local mode/ prioritized terminal control	The output stage is enabled.	–
Yellow **Flashing, 2 Hz**	Ready	The brake is released without drive enable.	–
Yellow **Steady light**	Ready Device inhibited	The device is ready for operation, the output stage is inhibited.	–
Green **Flashing, 4 Hz**	Device enabled Current limit active	The drive is at the current limit.	Reduce the load.
Green **Steady light**	Device enabled	The output stage is enabled.	–

12.6.3 Gateway-specific LEDs for PROFINET IO and EtherNet/IP™ or Modbus TCP

"DRIVE" LED

For more information, refer to chapter "LED DRIVE" (→ 🗎 149).

"US1" LED

This LED indicates the status of the PROFINET interface. The state includes the start-up, normal operation, error mode and energy-saving operation operating modes.

Status	Possible cause	Measure
Yellow **Flashing** Cyclic duration factor: 250 ms Switch-off time: 250 ms	The PROFINET interface is just starting up after a reset.	–
Green **Permanently lit**	The PROFINET interface is operating without errors.	–
Green **Flashing** Cyclic duration factor: 500 ms Switch-off time: 3000 ms	The PROFINET interface is in energy-saving mode (PROFIenergy mode).	–
Red **Permanently lit**	The PROFINET interface has detected a fault. **Note:** A timeout of the PROFINET connection is not an internal fault.	Switch the device off and back on again. If the fault occurs repeatedly, contact SEW-EURODRIVE Service.

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"MS" LED

State	Possible cause	Measure
– **Off**	No power supply or DC 24 V supply.	• Check the voltage supply.
Green **Flashing**	The device has not been configured yet.	• Configure the device. • Check the DHCP server connection (only if DHCP is activated and the state is persistent).
Green **Illuminated**	Device OK.	–
Red **Flashing**	A recoverable error has occurred on the device.	• Check whether another device with the same IP address is available in the network. • Change the IP address of the device. • Check the DHCP settings for IP address assignment of the DHCP server (only when using a DHCP server).
Red **Illuminated**	An unrecoverable error has occurred on the device.	• Switch on the device again. • Reset the device to the factory settings. • If this fault occurs repeatedly, replace the device or contact SEW-EURODRIVE Service.
Red/green **Flashing**	The device is performing an LED test. This state may only be active for a short time during startup.	–
	The device is waiting for a target unit network ID (TUNID).	Assign a target unit network ID (TUNID) to the device.
	Parameterization of the device is required.	Check the parameterization of the safety option.

"BF" LED

This LED indicates the status of the PROFINET interface. The state includes communication link, bus error and process data configuration.

Status	Possible cause	Measure
Off	Error-free operating state. The PROFINET device is exchanging data with the PROFINET controller (Data Exchange state).	–

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Status	Possible cause	Measure
Red **Permanently lit**	Connection to the PROFINET controller has failed. Bus communication has been interrupted.	Check the PROFINET connection of the PROFINET device. Check all the cables in the PROFINET network.
	The PROFINET controller is not in operation.	Check the PROFINET controller.
	The PROFINET device does not detect a PROFINET baud rate.	Check the configuration of the PROFINET controller.
Yellow **Permanently lit**	There is a connection to the PROFINET controller, but the configuration of the PROFINET network is faulty. The following faults may have occurred: • A hardware module was selected that does not support the PROFINET interface. • The standard process data and the safe process data have been assigned mixed to the PROFINET device.	Check the configuration of the PROFINET controller.

"NS" LED

Status	Possible cause	Measure
– **Off**	The device is switched off. No DC 24 V supply.	• Check the DC 24 V supply. • Switch on the device again.
	The IP address is not set.	• Set the IP address.
Green **Flashing**	The connection to the Ethernet master has failed. The device does not detect a connection to the Ethernet master (bus error).	• Check the Ethernet connection of the device. • Check all Ethernet connections.
Green **Illuminated**	The IP address is set. The Ethernet connection has been established.	–
Red **Flashing**	The timeout time of the controlling connection has expired. The status is reset by restarting communication.	• Check the fieldbus connection. • Check the master/scanner. • Check all Ethernet connections.
Red **Illuminated**	A conflict was detected during IP address assignment.	• Check whether another device with the same IP address is available in the network. • Change the IP address of the device. • Check the DHCP settings for IP address assignment of the DHCP server (only when using a DHCP server).

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Status	Possible cause	Measure
Red/green **Flashing**	The device is performing an LED test. This state may only be active for a short time during startup.	–
	The device has received the designated target unit network ID (TUNID). The LED will keep flashing until the device has received the APPLY_TUNID service and the validation is successfully completed.	

"LNK/ACT" LED

Status	Meaning
All LEDs **Green** **Permanently lit**	A physical connection to another Ethernet node was detected. Currently, no data is being exchanged via the Ethernet port.
All LEDs **Flashing green** Cyclic duration factor: 500 ms Switch-off time: 500 ms	The flashing test has been activated to localize the Ethernet nodes visually.
All LEDs **Off**	No physical connection to further Ethernet nodes was detected.
LED at the respective Ethernet port **Green/yellow** **Flashing**	Data is being sent or received via the Ethernet port.

"GATEWAY" LED

Status	Meaning	Information
Green **Illuminated**	Operation/OK	No fault/no warning
Green **Flashes at 1 Hz, 50% on**	Fieldbus warning PDO OK	Warning 45.50 • The fieldbus interface sub-component has signaled a warning. • Read the warning from the sub-component and derive measures for corrective action. • Process data communication is not affected.

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Status	Meaning	Information
Yellow **Illuminated**	Gateway warning PDO OK	All warnings except 45.x, but with 45.5 and 45.9 • Process data communication is OK. A warning has occurred in the gateway; see fault message. • For 45.5: Engineering via the fieldbus interface no longer works, or only works to a limited extent; see fault description. • For 45.9: The gateway has detected a non-critical fault on the device-internal connection to the fieldbus interface.
Yellow **Flashes at 1 Hz, 50% on**	Process data faulty or stopped	All warnings 45.x, except 45.5, 45.9, and 45.50 • The process data connection to the controller is faulty; see fault message for corrective action.
Red **Flashes at 1 Hz, 50% on**	Fault	All warnings that do not fall into the three categories above. • A fault has been detected on the gateway; see fault message for corrective action.

"CBus" LED

Status	Meaning
Green **Illuminated**	Operation/OK
Green **Flashes at 1 Hz, 50% on**	Process data stopped (fieldbus timeout)
Yellow **Flashes at 1 Hz, 50% on**	At least one CBus station without feedback
Red **Flashes at 1 Hz, 50% on**	No CBus station with feedback
Green **Flashes at 1 Hz, 150 ms on**	Auto addressing active
Red **Flashes at 1 Hz, 150 ms on**	Auto addressing failed
Yellow **Flashes at 1 Hz, 150 ms on**	Expected number of stations is not equal to the number of stations found.
Off	Initialization of the system

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12.6.4 Gateway-specific LEDs for EtherCAT®/SBus^{PLUS}

"DRIVE" LED

For more information, refer to chapter "LED DRIVE" (→ 🗎 149).

"RUN" LED

Status	Meaning
Off	"INIT" state The interface is in the "INIT" state.
Green **Flashing**	"PRE_OPERATIONAL" state Mailbox communication is possible. Process data communication is not possible.
Green **Flashing (1 Hz)**	"SAFE_OPERATIONAL" state Mailbox and process data communication is possible. Safety-related output signals are not output.
Green **Illuminated**	"OPERATIONAL Mode" state Mailbox and process data communication is possible.

"ERR" LED

Status	Meaning
Off	No error The interface is in operating state.
Red **Flickering**	Boot error A BOOT error has occurred. "INIT" state has been reached. However the "Change" parameter is set to "0x01:change/error".
Red **Flashing**	Invalid configuration A general configuration error has occurred.
Red **Flashing once**	Unrequested state change The slave application has changed the state automatically. The "Change" parameter is set to "0x01:change/error".
Red **Flashing twice**	Application watchdog timeout A watchdog timeout error has occurred in the application.
Red **Illuminated**	PDI[1)] Watchdog Timeout A PDI watchdog timeout error has occurred.

1) PDI = Process Data Interface

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"LNK/ACT" LED

Status	Meaning
Off	No link available. No physical connection to a neighboring device was detected.
Green **Illuminated**	Link available, no bus activity. A physical connection to a neighboring device was detected. No data is being exchanged via the Ethernet port.
Green **Flickering**	Link available, bus activity. A physical connection to a neighboring device was detected. Data is being exchanged via the Ethernet port.

"GATEWAY" LED

Status	Meaning	Information
Green **Illuminated**	Operation/OK	No fault/no warning
Green **Flashes at 1 Hz, 50% on**	Fieldbus warning PDO OK	Warning 45.50 • The fieldbus interface sub-component has signaled a warning. • Read the warning from the sub-component and derive measures for corrective action. • Process data communication is not affected.
Yellow **Illuminated**	Gateway warning PDO OK	All warnings except 45.x, but with 45.5 and 45.9 • Process data communication is OK. A warning has occurred in the gateway; see fault message. • For 45.5: Engineering via the fieldbus interface no longer works, or only works to a limited extent; see fault description. • For 45.9: The gateway has detected a non-critical fault on the device-internal connection to the fieldbus interface.
Yellow **Flashes at 1 Hz, 50% on**	Process data faulty or stopped	All warnings 45.x, except 45.5, 45.9, and 45.50 • The process data connection to the controller is faulty; see fault message for corrective action.

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Status	Meaning	Information
Red **Flashes at 1 Hz, 50% on**	Fault	All warnings that do not fall into the three categories above. • A fault has been detected on the gateway; see fault message for corrective action.

"CBus" LED

Status	Meaning
Green **Illuminated**	Operation/OK
Green **Flashes at 1 Hz, 50% on**	Process data stopped (fieldbus timeout)
Yellow **Flashes at 1 Hz, 50% on**	At least one CBus station without feedback
Red **Flashes at 1 Hz, 50% on**	No CBus station with feedback
Green **Flashes at 1 Hz, 150 ms on**	Auto addressing active
Red **Flashes at 1 Hz, 150 ms on**	Auto addressing failed
Yellow **Flashes at 1 Hz, 150 ms on**	Expected number of stations is not equal to the number of stations found.
Off	Initialization of the system

12.7 Basic device error description

12.7.1 Error 1 Output stage monitoring

Error: 1.1 (0101hex | 257dec) **Description: Overcurrent on motor output terminals**		
	Response: Output stage inhibit	
	Cause	Measure
	Short circuit at the motor output.	– Check motor cable for short circuit. – Remove the short circuit.
	Power output stage defective.	Contact SEW-EURODRIVE Service.
	Motor current too high.	Connect a smaller motor.

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Error: 1.2 (0102hex | 258dec) Description: Overcurrent in output stage		
	Response: Output stage inhibit	
	Cause	Measure
	Motor current too high.	Connect a smaller motor.
	Current controller of intelligent supply module set incorrectly.	Contact SEW-EURODRIVE Service.
	Ramp time too short.	Increase the ramp time.
	One of the following components is faulty: – Internal current supply – Current measurement – Phase module	Contact SEW-EURODRIVE Service.
	External DC 24 V supply voltage is instable.	Check the DC 24 V supply voltage.
	The voltage fluctuations are too strong. The current controller of the intelligent power supply module cannot compensate for them.	– Stabilize the voltage. – Check the supply. – Check the project planning.

12.7.2 Error 6 Line fault

Error: 6.1 (0601hex | 1537dec) Description: Line phase failure		
	Response: Line phase failure	
	Cause	Measure
	Line phase missing.	Check the power supply cable.
	Poor line voltage quality.	Check supply (fuses, contactor, line components).
	DC link voltage periodically too low.	Check the line voltage.

12.7.3 Error 7 DC link

Error: 7.1 (0701hex | 1793dec) Description: DC link overvoltage		
	Response: Output stage inhibit	
	Cause	Measure
	Maximum permitted DC link voltage limit exceeded.	– Check the connection of the braking resistor. – Decrease deceleration. – Check the configuration of the braking resistor (resistance value).

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12.7.4 Error 8 Speed monitoring

Error: 8.1 (0801hex | 2049dec) Description: Speed monitoring – motor mode		
	Response: Output stage inhibit	
	Cause	Measure
	Speed controller operates at setting limit (mechanical overload or phase failure in supply system or motor).	– Increase delay time of speed monitoring. – Reduce the load. – Increase current limiting/torque limiting. – Reduce the acceleration. – Check the motor cable, motor, and line phases.
	Encoder not connected correctly.	Check the encoder connection.
	Encoder has incorrect direction of rotation.	Check the direction of rotation.

Error: 8.2 (0802hex | 2050dec) Description: Speed monitoring – generator mode		
	Response: Output stage inhibit	
	Cause	Measure
	Speed controller operates at setting limit (mechanical overload or phase failure in supply system or motor).	– Increase delay time of speed monitoring. – Reduce the load. – Increase current limiting/torque limiting. – Decrease deceleration. – Check the motor cable, motor, and line phases.
	Encoder not connected correctly.	Check the encoder connection.
	Encoder has incorrect direction of rotation.	Check the direction of rotation.

Error: 8.3 (0803hex | 2051dec) Description: Maximum speed at motor shaft exceeded		
	Response: Output stage inhibit	
	Cause	Measure
	The actual speed has exceeded the limit value "Maximum speed at motor shaft". This limit value is set to match the motor and gear unit at startup.	Reduce the maximum motor speed.
	The setpoint is too high.	Reduce the setpoint.
	The motor is driven by the load.	Check the project planning of the drive.

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12.7.5 Error 9 Control mode

Error: 9.1 (0901hex | 2305dec) Description: Magnetization of motor not possible		
	Response: Output stage inhibit	
	Cause	Measure
	User-defined current limit or output stage monitoring reduced possible maximum current to such a degree that required magnetizing current cannot be set.	– Reduce output stage utilization by reducing the PWM frequency or the load. – Increase user-defined current limit. – Connect a smaller motor.

Error: 9.2 (0902hex | 2306dec) Description: Operating mode not possible with active control mode		
	Response: Output stage inhibit	
	Cause	Measure
	The active control mode does not support the operating mode selected in the current FCB. EXAMPLE: The V/f control mode does not support the FCB "Position control" or "Torque control".	– Use a control mode that supports the required operating mode. If necessary, connect an encoder. or – Select an operating mode that is supported by the current control mode.

Error: 9.3 (0903hex | 2307dec) Description: Absolute rotor position not available		
	Response: Output stage inhibit	
	Cause	Measure
	The active control mode requires an absolute rotor position. The encoder set as the source of the actual speed does not provide an absolute rotor position.	– Use an absolute encoder. or – Identify the rotor position using FCB 18.

Error: 9.4 (0904hex | 2308dec) Description: Correct current supply of motor not possible		
	Response: Output stage inhibit	
	Cause	Measure
	With active current monitoring during premagnetization, the required current could not be impressed into the motor.	– Check motor cable. – Check the motor winding connection (star, delta) – Check motor windings. – If the error occurs repeatedly, contact SEW-EURODRIVE Service. INFORMATION for SEW-EURODRIVE Service: Check output stage.

Error: 9.5 (0905hex | 2309dec) Description: Maximum output frequency exceeded		
	Response: Output stage inhibit	
	Cause	Measure
	Maximum output frequency exceeded.	– Reduce maximum rotation speed/maximum speed. – Reduce setpoint.

Error: 9.6 (0906hex | 2310dec) Description: Maximum model speed exceeded		
	Response: Output stage inhibit	
	Cause	Measure
	The motor speed calculated in ELSM® control mode is too high for motor control.	– Reduce the sampling cycle ("Sampling cycle n/x control" parameter). – Reduce the speed.

Error: 9.8 (0908hex | 2312dec) Description: Motor protection function – demagnetization		
	Response: Output stage inhibit	
	Cause	Measure
	The motor is blocked.	Check the motor for blockage.
	Motor has already been operated at a speed below the transition speed for too long.	Check the drive selection.
	Motor has not been started up properly.	Perform motor startup again and run the drive function "FCB 25 Motor parameter measurement".

Error: 9.9 (0909hex | 2313dec) Description: Parameter measurement not possible with active motor type		
	Response: Output stage inhibit	
	Cause	Measure
	Only the parameters of an asynchronous motor or synchronous motor can be measured.	Omit parameter measurement.

Error: 9.10 (090Ahex | 2314dec) Description: Rotor stall monitoring		
	Response: Output stage inhibit	
	Cause	Measure
	Current control cannot hold load torque.	Reduce the load.

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Error: 9.11 (090Bhex | 2315dec) Description: Standstill current function not possible		
	Response: Output stage inhibit	
	Cause	Measure
	In ELSM® control mode, the standstill current function can only be used if the rotor position can be measured.	Activate rotor position measurement and perform the drive function "FCB 25 Motor parameter measurement".

Error: 9.13 (090Dhex | 2317dec) Description: Torque control not within valid speed range	
Response: Output stage inhibit	
Cause	Measure
Motor speed too low.	– Perform motor startup again and run the drive function "FCB 25 Motor parameter measurement". – If the error occurs repeatedly, contact SEW-EURODRIVE Service.
The flying start function is deactivated.	Activate the flying start function.
The motor is blocked.	Check the motor for blockage.

Error: 9.14 (090Ehex | 2318dec) Description: Transition of open-loop speed control to closed-loop speed control failed	
Response: Output stage inhibit	
Cause	Measure
The motor is blocked.	Check the motor for blockage.
The motor accelerates too slowly.	Check the setting of the speed controller parameter "Load mass moment of inertia".
Ohmic resistance was measured incorrectly.	If the ohmic resistance of the motor cable is smaller than 10% of the ohmic resistance of the motor winding, deactivate the parameter "Measure stator resistance".
Motor has not been started up properly.	Perform motor startup again and run the drive function "FCB 25 Motor parameter measurement".
The drive is overloaded by mechanical sluggishness.	– Reduce the load. – Check the mechanical components. – Check the drive selection.

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Error: 9.15 (090Fhex | 2319dec) Description: Timeout		
	Response: Output stage inhibit	
	Cause	Measure
	The parameterization of the motor model is implausible.	– Perform motor startup again and run the drive function "FCB 25 Motor parameter measurement". – If the error occurs repeatedly, contact SEW-EURODRIVE Service.

Error: 9.16 (0910hex | 2320dec) Description: Deviation of motor inductance too large		
	Response: Output stage inhibit	
	Cause	Measure
	The measured motor inductance differs greatly from the inductance in the motor data set.	– Check motor startup and perform again. – Check motor winding connection type (star/ delta).

12.7.6 Error 10 Data Flexibility

Error: 10.1 (0A01hex | 2561dec) Description: Initialization error		
	Response: Application stop + output stage inhibit	
	Cause	Measure
	Error detected in the init task. The return code is not equal to 0.	Check the program. Contact SEW-EURODRIVE Service.

Error: 10.2 (0A02hex | 2562dec) Description: Illegal operation code		
	Response: Application stop + output stage inhibit	
	Cause	Measure
	Unknown program command (illegal opcode) detected in Data Flexibility program.	Check the program. Contact SEW-EURODRIVE Service.
	The version of the MOVIKIT® software module in use does not run with the current firmware version of the device.	– Adjust the firmware version of the device according to the version overview in the installation notes. or – Adjust the version of the MOVIKIT® software module according to the version overview in the installation notes. In the context menu of the device, execute the [Adjust version and device] menu command.

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Error: 10.3 (0A03hex | 2563dec) Description: Access to memory defective		
	Response: Application stop + output stage inhibit	
	Cause	Measure
	Memory area violated while accessing array. For example, an address that does not exist or is not permitted was addressed.	Check the program. Contact SEW-EURODRIVE Service.

Error: 10.4 (0A04hex | 2564dec) Description: Stack overflow		
	Response: Application stop + output stage inhibit	
	Cause	Measure
	Overflow of Data Flexibility stack detected.	Check the program. Contact SEW-EURODRIVE Service.

Error: 10.5 (0A05hex | 2565dec) Description: Division by 0		
	Response: Application stop + output stage inhibit	
	Cause	Measure
	Division by 0 was performed in the program.	Check the program. Contact SEW-EURODRIVE Service.

Error: 10.6 (0A06hex | 2566dec) Description: Runtime error		
	Response: Application stop + output stage inhibit	
	Cause	Measure
	The watchdog has detected an error. The program runtime exceeds the permitted time.	Check the program. Contact SEW-EURODRIVE Service.
	Execution time of PDI task or PDO task exceeds permitted time.	– Use slicing mode. – Check the program. Contact SEW-EURODRIVE Service.

Error: 10.7 (0A07hex | 2567dec) Description: Calculation result too large		
	Response: Application stop + output stage inhibit	
	Cause	Measure
	Calculation result of multiplication/division command exceeds 32 bits.	Check the program. Contact SEW-EURODRIVE Service.
	Failed to write calculation result of multiplication/division command into result variable.	Check the program. Contact SEW-EURODRIVE Service.

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Error: 10.8 (0A08hex | 2568dec) Description: Illegal connection		
	Response: Application stop + output stage inhibit	
	Cause	Measure
	The parameter index to be linked with the connect command in the init task does not exist or is not permitted for access via process data (see parameter list).	Check the program. Contact SEW-EURODRIVE Service.

Error: 10.9 (0A09hex | 2569dec) Description: CRC error	
Response: Application stop + output stage inhibit	
Cause	Measure
The checksum (CRC) is incorrect. This can be due to the following reasons: – The program memory is corrupt. – Unauthorized write access was executed on the program memory.	Adjust the program and load it again.

Error: 10.10 (0A0Ahex | 2570dec) Description: Setpoint cycle time not supported	
Response: Application stop + output stage inhibit	
Cause	Measure
The set setpoint cycle time is not supported.	Set the setpoint cycle time to the default value of 1 ms.

Error: 10.11 (0A0Bhex | 2571dec) Description: No application program loaded	
Response: Output stage inhibit	
Cause	Measure
No Data Flexibility application program loaded.	– Load program. or – Deactivate Data Flexibility.

Error: 10.12 (0A0Chex | 2572dec) Description: Runtime warning	
Response: Warning	
Cause	Measure
The program requires more runtime than has been configured.	Check the program. Contact SEW-EURODRIVE Service.

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Error: 10.20 (0A14hex | 2580dec) Description: Application error – warning		
	Response: Warning	
	Cause	Measure
	Error detected in the application program.	Check the program. Contact SEW-EURODRIVE Service.

Error: 10.21 (0A15hex | 2581dec) Description: Application error – application stop + output stage inhibit		
	Response: Application stop + output stage inhibit	
	Cause	Measure
	Error detected in the application program.	Check the program. Contact SEW-EURODRIVE Service.

Error: 10.22 (0A16hex | 2582dec) Description: Application error – emergency stop + output stage inhibit		
	Response: Emergency stop + output stage inhibit	
	Cause	Measure
	Error detected in the application program.	Check the program. Contact SEW-EURODRIVE Service.

Error: 10.23 (0A17hex | 2583dec) Description: Application error – output stage inhibit		
	Response: Output stage inhibit	
	Cause	Measure
	Error detected in the application program.	Check the program. Contact SEW-EURODRIVE Service.

Error: 10.24 (0A18hex | 2584dec) Description: Application error – warning with self reset		
	Response: Warning with self reset	
	Cause	Measure
	Error detected in the application program.	Check the program. Contact SEW-EURODRIVE Service.

Error: 10.25 (0A19hex | 2585dec) Description: Application error – application stop + output stage with self-reset		
	Response: Application stop + output stage inhibit with self reset	
	Cause	Measure
	Error detected in the application program.	Check the program. Contact SEW-EURODRIVE Service.

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Error: 10.26 (0A1Ahex | 2586dec) Description: Application error – emergency stop + output stage inhibit with self-reset		
	Response: Emergency stop + output stage inhibit with self reset	
	Cause	Measure
	Error detected in the application program.	Check the program. Contact SEW-EURODRIVE Service.

Error: 10.27 (0A1Bhex | 2587dec) Description: Application error – output stage inhibit with self-reset		
	Response: Output stage inhibit with self reset	
	Cause	Measure
	Error detected in the application program.	Check the program. Contact SEW-EURODRIVE Service.

Error: 10.99 (0A63hex | 2659dec) Description: Unknown error		
	Response: Application stop + output stage inhibit	
	Cause	Measure
	Unknown Data Flexibility error.	Contact SEW-EURODRIVE Service.

12.7.7 Error 11 Temperature monitoring

Error: 11.1 (0B01hex | 2817dec) Description: Heat sink overtemperature		
	Response: Output stage inhibit	
	Cause	Measure
	The capacity utilization is too high. Maximum permitted heat sink temperature exceeded.	– Reduce the load. – Reduce the PWM frequency. – Reduce the ambient temperature.
	Air circulation disrupted. Maximum permitted heat sink temperature exceeded.	– Check air circulation. – Ensure sufficient cooling.
	The fan (if available) is defective. Maximum permitted heat sink temperature exceeded.	Contact SEW-EURODRIVE Service.
	Temperature sensor defective. Maximum permitted heat sink temperature exceeded.	Contact SEW-EURODRIVE Service.
	The fan (if present) is blocked or dirty.	– Remove foreign objects. – Clean the fan.

Error: 11.7 (0B07hex | 2823dec) Description: Wire break at temperature sensor of heat sink		
	Response: Output stage inhibit	
	Cause	Measure
	Wire break at temperature sensor of heat sink.	Contact SEW-EURODRIVE Service.

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Error: 11.8 (0B08hex | 2824dec) Description: Short circuit at temperature sensor of heat sink		
	Response: Output stage inhibit	
	Cause	Measure
	Short circuit on temperature sensor of heat sink.	Contact SEW-EURODRIVE Service.

12.7.8 Error 12 Brake

Error: 12.1 (0C01hex | 3073dec) Description: Brake output fault		
	Response: Application stop + output stage inhibit	
	Cause	Measure
	No brake connected.	– Check the brake connection. – Check the startup.
	Brake cable disconnected in switched-on state.	Check the connection of the brake.
	The brake was overloaded by an overcurrent > 2 A.	– Make sure that the connected brake is permitted. – Check the brake.
	The brake was overloaded by frequent connection (> 0.5 Hz).	Reduce the switching frequency of the brake.

Error: 12.2 (0C02hex | 3074dec) Description: DC 24 V brake voltage not within tolerance range		
	Response: Application stop + output stage inhibit	
	Cause	Measure
	The DC 24 V supply voltage is not within the tolerance range of 24 – 26.4 V.	Check the DC 24 V supply voltage.

12.7.9 Error 16 Startup

Error: 16.1 (1001hex | 4097dec) Description: Writing motor parameters with active FCB 25		
	Response: Output stage inhibit	
	Cause	Measure
	A motor parameter has been written while FCB 25 is still active.	Deactivate FCB 25.

Error: 16.2 (1002hex | 4098dec) Description: Cannot calculate controller parameters		
	Response: Output stage inhibit	
	Cause	Measure
	Long dead time of encoder used prevents calculation of required filter coefficients.	Use an encoder with a shorter dead time.

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Error: 16.3 (1003hex | 4099dec) Description: Thermal motor model not possible		
	Response: Output stage inhibit	
	Cause	Measure
	Starting up thermal model not yet completed or its parameterization invalid.	Perform startup again.

Error: 16.5 (1005hex | 4101dec) Description: Current limit smaller than magnetizing current of the motor		
	Response: Output stage inhibit	
	Cause	Measure
	Current limit smaller than magnetizing current of motor calculated by active control mode.	Increase the current limit.

Error: 16.6 (1006hex | 4102dec) Description: Control mode not possible		
	Response: Output stage inhibit	
	Cause	Measure
	Wrong control mode selected for the motor.	Choose a suitable control mode.
	When starting up a synchronous third-party motor, some control modes and drive functions are only permitted after motor parameter measurement.	Perform a motor parameter measurement using the FCB 25 drive function.

Error: 16.7 (1007hex | 4103dec) Description: PWM frequency not possible		
	Response: Output stage inhibit	
	Cause	Measure
	The set speed controller sampling time of 1 ms is not possible with the set PWM frequency.	– Set a PWM frequency of 4, 8, or 16 kHz. or – Adjust the sampling cycle.
	The motor requires a higher PWM frequency than the inverter can provide.	Use an inverter with suitable PWM frequency.
	The ELSM® control mode can only be used with an inverter that supports PWM frequencies of 2.5, 4 or 8 kHz.	Use an inverter with suitable PWM frequency.
	The FCB 25 drive function can only be used with an inverter that supports PWM frequencies of 2.5, 4 or 8 kHz.	Use an inverter with suitable PWM frequency.
	The FCB 18 drive function can only be used with an inverter that supports PWM frequencies of 2.5, 4 or 8 kHz.	Use an inverter with suitable PWM frequency option.

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Error: 16.8 (1008hex | 4104dec) Description: Temperature sensor motor 1 – startup error		
	Response: Output stage inhibit	
	Cause	Measure
	Error taking into operation the temperature sensor of motor 1.	Check the startup parameters.

Error: 16.9 (1009hex | 4105dec) Description: Temperature sensor motor 2 – startup error		
	Response: Output stage inhibit	
	Cause	Measure
	Error taking into operation the temperature sensor of motor 2.	Check the startup parameters.

Error: 16.10 (100Ahex | 4106dec) Description: Actual position source not assigned		
	Response: Application stop + output stage inhibit	
	Cause	Measure
	In the selected drive function, an encoder is required for position control that is used as the source for calculating the actual position.	– Assign an encoder for the position control in the drive train configuration. – If no encoder is present, only use FCBs without positioning control.

Error: 16.11 (100Bhex | 4107dec) Description: Error calculating motor data		
	Response: Output stage inhibit	
	Cause	Measure
	Motor startup cannot be performed because of inconsistent motor data or wrong device configuration data.	– Check the startup. – If the error occurs repeatedly, contact SEW-EURODRIVE Service.

Error: 16.12 (100Chex | 4108dec) Description: Motor data write sequence not adhered to		
	Response: Output stage inhibit	
	Cause	Measure
	Write sequence not adhered to before writing electrical startup parameters.	Perform startup again.

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Error: 16.13 (100Dhex | 4109dec) Description: Several motor protection models active		
	Response: Output stage inhibit	
	Cause	Measure
	Several motor protection models are active in one of the thermal motor monitorings.	– Perform startup again. – If the error occurs repeatedly, contact SEW-EURODRIVE Service.

Error: 16.20 (1014hex | 4116dec) Description: Nominal rotational speed too high or nominal frequency too low		
	Response: Output stage inhibit	
	Cause	Measure
	No plausible value could be determined when calculating the number of pole pairs from the nominal speed and nominal frequency.	– Check the settings for nominal speed and nominal frequency. – Perform startup again.

Error: 16.21 (1015hex | 4117dec) Description: Negative nominal slip determined		
	Response: Output stage inhibit	
	Cause	Measure
	Negative slip determined at startup.	– Check the settings for nominal speed and nominal frequency. – Perform startup again.

Error: 16.22 (1016hex | 4118dec) Description: Number of pole pairs cannot be determined		
	Response: Output stage inhibit	
	Cause	Measure
	It is not possible to calculate the number of pole pairs accurately from nominal frequency and nominal rotational speed.	Enter the number of pole pairs.

Error: 16.23 (1017hex | 4119dec) Description: Plausibility check failed		
	Response: Output stage inhibit	
	Cause	Measure
	The estimated nominal power does not match the nominal power entered at startup.	– Check the entered data. – Perform startup again.

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Error: 16.24 (1018hex | 4120dec) Description: Speed controller sampling time not possible with PWM frequency or control mode		
	Response: Application stop + output stage inhibit	
	Cause	Measure
	The set speed controller sampling time of 2 ms is not possible with the set PWM frequency.	– Set the PWM frequency to match the sampling cycle. or – Set sampling cycle to 2 ms (suitable for PWM frequency).
	For ELSM® control mode, the only permitted speed controller sampling times are 1 ms and 2 ms.	Set the sampling time to 1 ms or 2 ms.

Error: 16.25 (1019hex | 4121dec) Description: User-defined current limit too low for standstill current	
Response: Output stage inhibit	
Cause	Measure
User-defined current limit value too low for configured standstill current.	– Increase user-defined current limit. or – Reduce standstill current.

Error: 16.26 (101Ahex | 4122dec) Description: Nominal values incomplete or not plausible	
Response: Output stage inhibit	
Cause	Measure
One or all of the following parameters are not set or are not plausible: – Nominal voltage – Nominal current – Nominal speed – Nominal torque	– Check the entered data. – Perform startup again.

Error: 16.27 (101Bhex | 4123dec) Description: Maximum current or maximum torque not plausible	
Response: Output stage inhibit	
Cause	Measure
The following parameters are not set or are not plausible: – Maximum current – Maximum torque	– Check the entered data. – Perform startup again.

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Error: 16.30 (101Ehex | 4126dec) Description: Faulty EtherCAT® EEPROM configuration state		
	Response: Warning	
	Cause	Measure
	EtherCAT®/SBusPLUS EEPROM not configured correctly.	Contact SEW-EURODRIVE Service.

Error: 16.55 (1037hex | 4151dec) Description: PID controller – source of actual value not defined		
	Response: Output stage inhibit	
	Cause	Measure
	The PID controller has been activated but the source of the actual value has not been defined yet.	Define the source of the actual value.

Error: 16.60 (103Chex | 4156dec) Description: Parameter setting for 3-wire control not valid		
	Response: Warning	
	Cause	Measure
	No 3-wire control stop terminal configured.	Set stop terminal parameters.

12.7.10 Error 17 Internal processor error

Error: 17.7 (1107hex | 4359dec) Description: Exception error		
	Response: Output stage inhibit	
	Cause	Measure
	Internal trap in CPU.	– Switch the device off and on again. – If the error occurs repeatedly, contact SEW-EURODRIVE Service.

Error: 17.8 (1108hex | 4360dec) Description: Non-volatile data not loaded		
	Response: Output stage inhibit System state: Fault acknowledgment with CPU reset	
	Cause	Measure
	The CPU has been restarted several times without firmware being fully initialized. The non-volatile data is not loaded, the default values remain active.	– Acknowledge the error. – Check the voltage supply. – If the error occurs repeatedly, contact SEW-EURODRIVE Service.

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12.7.11 Error 18 Software error

Error: 18.1 (1201hex | 4609dec) Description: Error in motor management interface		
	Response: Output stage inhibit System state: Fault acknowledgment with CPU reset	
	Cause	Measure
	Error at motor management interface.	– Switch the device off and on again. – If the error occurs repeatedly, contact SEW-EURODRIVE Service.

Error: 18.3 (1203hex | 4611dec) Description: Task system – warning		
	Response: Warning	
	Cause	Measure
	Error detected while processing internal task system.	– Acknowledge the warning. – If the warning occurs repeatedly, contact SEW-EURODRIVE Service.

Error: 18.4 (1204hex | 4612dec) Description: Task system – error		
	Response: Output stage inhibit System state: Fault acknowledgment with CPU reset	
	Cause	Measure
	Error detected while processing internal task system.	– Switch the device off and on again. – If the error occurs repeatedly, contact SEW-EURODRIVE Service.

Error: 18.7 (1207hex | 4615dec) Description: Fatal software error		
	Response: Output stage inhibit System state: Fault acknowledgment with CPU reset	
	Cause	Measure
	Fatal software error.	– Switch the device off and on again. – If the error occurs repeatedly, contact SEW-EURODRIVE Service.

Error: 18.8 (1208hex | 4616dec) Description: Invalid error code		
	Response: Output stage inhibit	
	Cause	Measure
	Invalid error code requested.	– Switch the device off and on again. – If the error occurs repeatedly, contact SEW-EURODRIVE Service.

Error: 18.9 (1209hex | 4617dec) Description: Internal software error		
	Response: Output stage inhibit System state: Error acknowledgment with CPU reset	
	Cause	Measure
	The software signaled an unexpected event.	– Switch the device off and on again. – If the error occurs repeatedly, contact SEW-EURODRIVE Service.

Error: 18.10 (120Ahex | 4618dec) Description: Watchdog error		
	Response: Output stage inhibit	
	Cause	Measure
	The watchdog has detected an error. The software is not operating within the intended cycle time.	– Switch the device off and on again. – If the error occurs repeatedly, contact SEW-EURODRIVE Service.

Error: 18.12 (120Chex | 4620dec) Description: Configuration data faulty		
	Response: Output stage inhibit	
	Cause	Measure
	Configuration data not plausible or cannot be interpreted by active firmware version.	– Perform a firmware update. – Contact SEW-EURODRIVE Service.

Error: 18.13 (120Dhex | 4621dec) Description: Calibration data not plausible		
	Response: Output stage inhibit	
	Cause	Measure
	Calibration data not plausible.	Contact SEW-EURODRIVE Service.

12.7.12 Error 19 Process data

Error: 19.3 (1303hex | 4867dec) Description: Speed setpoint violation		
	Response: Application stop + output stage inhibit	
	Cause	Measure
	The speed setpoints in the profile value connection are not plausible. The speed limit may only be specified as an absolute value.	Correct the setpoint.

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Error: 19.4 (1304hex | 4868dec) Description: Acceleration setpoint violation		
	Response: Emergency stop + output stage inhibit	
	Cause	Measure
	The acceleration setpoint in the profile value connection is not plausible. The acceleration limit may only be specified as an absolute value.	Correct the setpoint.

Error: 19.5 (1305hex | 4869dec) Description: Drive function not available		
	Response: Application stop + output stage inhibit	
	Cause	Measure
	Non-existent drive function (FCB) selected.	Enter the available FCB number.

Error: 19.9 (1309hex | 4873dec) Description: Jerk setpoint violation		
	Response: Application stop + output stage inhibit	
	Cause	Measure
	The jerk time is not plausible. The jerk time may only be specified as an absolute value	Adjust the jerk time.

12.7.13 Error 20 Device monitoring

Error: 20.1 (1401hex | 5121dec) Description: Supply voltage fault		
	Response: Output stage inhibit System state: Fault acknowledgment with CPU reset	
	Cause	Measure
	Internal electronics supply voltage or externally connected DC 24 V supply voltage not within permitted voltage range.	– Check the voltage level of the external DC 24 V supply voltage and check for correct connection. – Acknowledge the fault. – If the error occurs repeatedly, contact SEW-EURODRIVE Service.
	24 V power supply unit overloaded.	Check the project planning for the power demand.

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Error: 20.2 (1402hex | 5122dec) Description: Supply voltage overloaded	
Response: Output stage inhibit	
Cause	Measure
The current load on the current paths of the DC 24 V supply voltage inside the device is too high. The signal outputs of the device were therefore de-energized.	– Remove all external consumers: – from the digital outputs of the basic device – from any options that may be present – from all encoder connections – from other consumers at the DC 24 V output voltage terminals – Acknowledge the error. – Reconnect the consumers with the device, one after the other, until the error message appears once again. – Connect a consumer with a lower current consumption or eliminate the short circuit.

Error: 20.7 (1407hex | 5127dec) Description: Internal hardware fault	
Response: Output stage inhibit System state: Fault acknowledgment with CPU reset	
Cause	Measure
Fault in device hardware.	– Acknowledge the fault. – If the error occurs repeatedly, replace the device.

Error: 20.8 (1408hex | 5128dec) Description: Fan – warning	
Response: Warning with self reset	
Cause	Measure
Fan function impaired.	– Check fan for contamination. – If the warning occurs repeatedly, contact SEW-EURODRIVE Service.

Error: 20.9 (1409hex | 5129dec) Description: Fan – fault	
Response: Application stop + output stage inhibit	
Cause	Measure
Fan defective.	Contact SEW-EURODRIVE Service.

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Error: 20.10 (140Ahex | 5130dec) Description: Fan – supply voltage fault		
	Response: Emergency stop + output stage inhibit	
	Cause	Measure
	Supply voltage of fan missing.	Contact SEW-EURODRIVE Service.

Error: 20.23 (1417hex | 5143dec) Description: Temperature detection in power section faulty		
	Response: Output stage inhibit	
	Cause	Measure
	Fault in device hardware. Power section does not provide temperature data.	– Acknowledge the fault. – Contact SEW-EURODRIVE Service.

Error: 20.24 (1418hex | 5144dec) Description: Required communication module missing		
	Response: Output stage inhibit	
	Cause	Measure
	A communication module used in the device configuration has been removed.	Plug in the communication module again.

Error: 20.25 (1419hex | 5145dec) Description: Communication module added		
	Response: Output stage inhibit	
	Cause	Measure
	A communication module that is not used in the device configuration has been added.	Remove the communication module.

12.7.14 Error 23 Power section

Error: 23.1 (1701hex | 5889dec) Description: Warning		
	Response: Warning with self reset	
	Cause	Measure
	Power section signaled a warning.	Observe the warning of the power section subcomponent. Identify the exact cause of this warning and take the appropriate measures to eliminate the error.

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Error: 23.2 (1702hex | 5890dec) Description: Error		
	Response: Emergency stop + output stage inhibit	
	Cause	Measure
	Power section detected an error.	Observe the error message of the power section subcomponent. Identify the exact cause of this error message and take the appropriate measures to eliminate the error.

Error: 23.3 (1703hex | 5891dec) Description: Critical error		
	Response: Output stage inhibit	
	Cause	Measure
	Power section detected critical error.	Observe the error message of the power section subcomponent. Identify the exact cause of this error message and take the appropriate measures to eliminate the error.

Error: 23.4 (1704hex | 5892dec) Description: Hardware fault		
	Response: Output stage inhibit	
	Cause	Measure
	A fault was detected on a component of the power section.	– Check for short circuit/ground fault at the output of the inverter. – Reduce the line capacity at the output of the inverter. – If the error occurs repeatedly, contact SEW-EURODRIVE Service.
	Error detected on switched-mode power supply.	Check the DC 24 V supply voltage.
	Error detected at the gate driver of a power semiconductor.	Contact SEW-EURODRIVE Service.

Error: 23.7 (1707hex | 5895dec) Description: Parameter communication timeout		
	Response: Emergency stop + output stage inhibit with self reset	
	Cause	Measure
	Timeout in parameter communication at the communication interface of the power section.	– Switch the device off and on again. – If the error occurs repeatedly, contact SEW-EURODRIVE Service.

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Error: 23.8 (1708hex | 5896dec) Description: Parameter communication error		
	Response: Output stage inhibit	
	Cause	Measure
	Parameter communication error detected at the communication interface of the power section.	– Switch the device off and on again. – If the error occurs repeatedly, contact SEW-EURODRIVE Service.

Error: 23.9 (1709hex | 5897dec) Description: Firmware of power section corrupt		
	Response: Output stage inhibit	
	Cause	Measure
	Failed to update firmware on power section.	– Update the firmware again. – If the error occurs repeatedly, contact SEW-EURODRIVE Service.

12.7.15 Error 25 Parameter memory monitoring

Error: 25.1 (1901hex | 6401dec) Description: Timeout warning		
	Response: Warning with self reset	
	Cause	Measure
	Access to memory (read/write) takes longer than expected.	No measure required. The warning will be reset automatically after completed memory access.

Error: 25.2 (1902hex | 6402dec) Description: Non-volatile memory system — runtime error		
	Response: Output stage inhibit System state: Fault acknowledgment with CPU reset	
	Cause	Measure
	Runtime error in non-volatile memory system.	– Switch the device off and on again. – Restore delivery state. Note that doing so will reset all data in the non-volatile memory to the values at delivery. – If the error occurs repeatedly, replace the device/memory module. Contact SEW-EURODRIVE Service. – Perform basic initialization. Contact SEW-EURODRIVE Service for this purpose.

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Error: 25.6 (1906hex | 6406dec) Description: Incompatible device configuration		
	Response: Output stage inhibit	
	Cause	Measure
	The data set of another device was copied in the device, which differs in device family, power or voltage from the current device.	– Acknowledge the error through a manual error reset. To do so, under [Diagnostics] > [Status] > [Error status] in the "Manual error reset" parameter, select the "With parameter set acceptance" setting. – Restore delivery state. Note that doing so will reset all data in the non-volatile memory to the values at delivery.
	The replaceable memory module of another device that differs from the current device with regard to the device family, power, voltage or design, for example, has been inserted in the device.	– Insert the correct memory module. – Acknowledge the error through a manual error reset. To do so, under [Diagnostics] > [Status] > [Error status] in the "Manual error reset" parameter, select the "With parameter set acceptance" setting. – Restore delivery state. Note that doing so will reset all data in the non-volatile memory to the values at delivery. – Perform basic initialization. Contact SEW-EURODRIVE Service for this purpose.
	The power section has been replaced and differs in its power rating and voltage from the original power section.	– Insert the correct power section. – Acknowledge the error through a manual error reset. To do so, under [Diagnostics] > [Status] > [Error status] in the "Manual error reset" parameter, select the "With parameter set acceptance" setting. – Restore delivery state. Note that doing so will reset all data in the non-volatile memory to the values at delivery.
	Subcomponent defective.	Contact SEW EURODRIVE Service.

Error: 25.7 (1907hex | 6407dec) Description: Non-volatile memory system – initialization error		
	Response: Output stage inhibit	
	Cause	Measure
	Initializing non-volatile memory system failed.	– Switch the device off and on again. – Restore delivery state. Note that doing so will reset all data in the non-volatile memory to the values at delivery. – If the error occurs repeatedly, contact SEW-EURODRIVE Service. – Perform basic initialization. Contact SEW-EURODRIVE Service for this purpose.

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Error: 25.10 (190Ahex | 6410dec) Description: Power section configuration data – version conflict		
	Response: Output stage inhibit	
	Cause	Measure
	Wrong version of configuration data of power section.	Contact SEW-EURODRIVE Service.

Error: 25.12 (190Chex | 6412dec) Description: Power section configuration data – CRC error		
	Response: Output stage inhibit	
	Cause	Measure
	Faulty configuration data of power section.	Contact SEW-EURODRIVE Service.

Error: 25.13 (190Dhex | 6413dec) Description: Control electronics configuration data – CRC error		
	Response: Output stage inhibit	
	Cause	Measure
	Faulty configuration data of control electronics.	Contact SEW-EURODRIVE Service.

Error: 25.14 (190Ehex | 6414dec) Description: Calibration data of power section – version conflict		
	Response: Output stage inhibit	
	Cause	Measure
	Wrong version of calibration data of power section.	Contact SEW-EURODRIVE Service.

Error: 25.15 (190Fhex | 6415dec) Description: Calibration data of control electronics – version conflict		
	Response: Output stage inhibit	
	Cause	Measure
	Wrong version of calibration data of control electronics.	Contact SEW-EURODRIVE Service.

Error: 25.16 (1910hex | 6416dec) Description: Calibration data of power section – CRC error		
	Response: Output stage inhibit	
	Cause	Measure
	Faulty calibration data of power section.	Contact SEW-EURODRIVE Service.

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Error: 25.17 (1911hex | 6417dec) Description: Calibration data of control electronics – CRC error		
	Response: Output stage inhibit	
	Cause	Measure
	Faulty calibration data of control electronics.	Contact SEW-EURODRIVE Service.

Error: 25.18 (1912hex | 6418dec) Description: QA data power section – CRC error		
	Response: Warning	
	Cause	Measure
	Faulty quality assurance data of power section.	Contact SEW-EURODRIVE Service.

Error: 25.19 (1913hex | 6419dec) Description: QA data control electronics – CRC error		
	Response: Warning	
	Cause	Measure
	Faulty quality assurance data of control electronics.	Contact SEW-EURODRIVE Service.

Error: 25.20 (1914hex | 6420dec) Description: Basic memory – initialization error		
	Response: Output stage inhibit	
	Cause	Measure
	Initialization of basic device memory failed.	Contact SEW-EURODRIVE Service.

Error: 25.21 (1915hex | 6421dec) Description: Basic unit memory – runtime error		
	Response: Emergency stop + output stage inhibit	
	Cause	Measure
	Runtime error detected in the basic device memory.	Contact SEW-EURODRIVE Service.

Error: 25.30 (191Ehex | 6430dec) Description: Replaceable memory module – initialization error		
	Response: Output stage inhibit	
	Cause	Measure
	The formatting of the replaceable memory module does not match.	– Switch the device off and on again. – Restore delivery state. Note that doing so will reset all data in the replaceable memory module to the values at delivery.
	Initialization of replaceable memory module failed after restoring delivery state.	– Contact SEW-EURODRIVE Service. – Perform basic initialization. Contact SEW-EURODRIVE Service for this purpose.

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Error: 25.31 (191Fhex | 6431dec) Description: Replaceable memory module – runtime error		
	Response: Emergency stop + output stage inhibit	
	Cause	Measure
	Runtime error detected in replaceable memory module.	– Insert new memory module and perform startup again. – If the error occurs repeatedly, contact SEW-EURODRIVE Service.

Error: 25.32 (1920hex | 6432dec) Description: Incompatible replaceable memory module	
	Response: Output stage inhibit System state: Error acknowledgment with CPU reset
Cause	Measure
The replaceable memory module is not compatible with the device.	Replace the memory module.

Error: 25.50 (1932hex | 6450dec) Description: Replaceable memory module of safety option – runtime error	
	Response: Output stage inhibit System state: Fault acknowledgment with CPU reset
Cause	Measure
Runtime error detected in the replaceable memory module of the safety option.	Contact SEW-EURODRIVE Service.

Error: 25.51 (1933hex | 6451dec) Description: Replaceable memory module of safety option – initialization error	
	Response: Warning
Cause	Measure
Initialization of the replaceable memory module of the safety option failed.	Contact SEW-EURODRIVE Service.

Error: 25.61 (193Dhex | 6461dec) Description: Restore point – error	
	Response: Emergency stop + output stage inhibit
Cause	Measure
Failed to create restore point.	Create the restore point again.

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Error: 25.62 (193Ehex | 6462dec) Description: Restore point not available		
	Response: Output stage inhibit System state: Fault acknowledgment with CPU reset	
	Cause	Measure
	A restore point that can be used to restore the parameter settings of a MOVIKIT® software module, for example, has not been created.	– Switch off the device and remove the CFX11x gateway or CFC11x communication module. In this case, the device is operated as a binary variant. – To create a restore point, contact SEW-EURODRIVE Service.

Error: 25.70 (1946hex | 6470dec) Description: Incompatible card configuration		
	Response: Emergency stop + output stage inhibit	
	Cause	Measure
	The current configuration of the cards does not match the configuration state saved during start-up. For example, a card was removed that was still present during startup.	– Restore the original configuration of the cards. – Acknowledge the error through a manual error reset. To do so, under [Diagnostics] > [Status] > [Error status] in the "Manual error reset" parameter, select the "With parameter set acceptance" setting.

12.7.16 Error 26 External fault

Error: 26.1 (1A01hex | 6657dec) Description: External fault via digital input/control bit		
	Response: External fault	
	Cause	Measure
	An error was triggered via a digital input or a bit of a control word.	– Eliminate the external fault. or – Change the response to an external fault under [Functions] > [Setpoints] > [Basic settings].

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12.7.17 Error 28 FCB drive functions

Error: 28.10 (1C0Ahex | 7178dec) Description: FCB 25 – Unbalanced motor phases		
	Response: Output stage inhibit	
	Cause	Measure
	Significantly different values determined in the three phases while measuring stator resistances.	– Check whether the motor is connected correctly. – Check all contact points on the motor and inverter. – Check the motor and motor cable for damage.

Error: 28.11 (1C0Bhex | 7179dec) Description: FCB 25 – High impedance motor phase		
	Response: Output stage inhibit	
	Cause	Measure
	At least one motor phase could not be measured during motor parameter measurement.	– Check whether the motor is connected correctly. – Check all contact points on the motor and inverter. – Check the motor and motor cable for damage.

Error: 28.12 (1C0Chex | 7180dec) Description: FCB 25 – Stator resistance measurement timeout		
	Response: Output stage inhibit	
	Cause	Measure
	Motor parameter measurement activated while motor is turning.	– Stop motor. – Start motor parameter measurement when the motor is at standstill.

Error: 28.13 (1C0Dhex | 7181dec) Description: FCB 25 – Characteristic curve identification not possible		
	Response: Output stage inhibit	
	Cause	Measure
	The characteristic curve cannot be clearly identified by the motor parameter measurement.	Contact SEW-EURODRIVE Service.

Error: 28.15 (1C0Fhex | 7183dec) Description: FCB 25 – Timeout		
	Response: Output stage inhibit	
	Cause	Measure
	Measuring of rotor resistance, leakage inductance, and stator inductance not completed.	Contact SEW-EURODRIVE Service.

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Error: 28.23 (1C17hex | 7191dec) Description: Minimum speed too high		
	Response: Output stage inhibit	
	Cause	Measure
	Minimum speed greater than application limit of the speed.	– Reduce the minimum speed. or – Increase the application limit.

Error: 28.24 (1C18hex | 7192dec) Description: FCB 05 – Limits of skip range outside setpoint limits		
	Response: Output stage inhibit	
	Cause	Measure
	The speed range of the active speed resonance skip function is larger than the permitted setpoint range. Both the minimum speed and the application limit are within the skip range. As such, each setpoint falls within the skip range.	– Adjust the range of the speed resonance skip function. – Adjust the minimum speed. – Adjust the application limit.

12.7.18 Error 29 HW limit switches

Error: 29.1 (1D01hex | 7425dec) Description: Positive limit switch hit		
	Response: HW limit switch – current drive train	
	Cause	Measure
	Positive hardware limit switch hit.	– Check the wiring of the hardware limit switch. – Check the target position. – Leave the hardware limit switch in the opposite direction.

Error: 29.2 (1D02hex | 7426dec) Description: Negative limit switch hit		
	Response: HW limit switch – current drive train	
	Cause	Measure
	Negative hardware limit switch hit.	– Check the wiring of the hardware limit switch. – Check the target position. – Leave the hardware limit switch in the opposite direction.

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Error: 29.3 (1D03hex | 7427dec) Description: Limit switch missing		
	Response: Emergency stop + output stage inhibit	
	Cause	Measure
	Positive and negative hardware limit switches hit at the same time.	– Check the wiring of the hardware limit switches. – Check the parameter setting of the digital inputs. – Check the parameter setting of the process output data.

Error: 29.4 (1D04hex | 7428dec) Description: Limit switches reversed	
Response: Emergency stop + output stage inhibit	
Cause	Measure
The error can be caused as follows: – The positive hardware limit switch was hit with a negative direction of rotation or – The negative hardware limit switch was hit with a positive rotation.	Check whether the hardware limit switch connections are swapped.

12.7.19 Error 31 Thermal motor protection

Error: 31.1 (1F01hex | 7937dec) Description: Temperature sensor motor 1 – wire break	
Response: Application stop + output stage inhibit	
Cause	Measure
Wire break detected at the temperature sensor of the motor.	Check the wiring of the temperature sensor.

Error: 31.2 (1F02hex | 7938dec) Description: Temperature sensor motor 1 – short circuit	
Response: Application stop + output stage inhibit	
Cause	Measure
Short circuit at temperature sensor of motor.	Check the wiring of the temperature sensor.

Error: 31.3 (1F03hex | 7939dec) Description: Temperature sensor motor 1 – overtemperature	
Response: Output stage inhibit	
Cause	Measure
The motor temperature determined by the temperature sensor exceeds the maximum permitted motor temperature.	– Let the motor cool down. – Check the motor for overload. – Check whether the correct temperature sensor has been configured.

Error: 31.4 (1F04hex | 7940dec) Description: Temperature model motor 1 – overtemperature		
	Response: Output stage inhibit	
	Cause	Measure
	The motor temperature determined by the temperature model exceeds the maximum permitted motor temperature.	– Let the motor cool down. – Check the motor for overload. – Check whether the correct temperature sensor has been configured.

Error: 31.7 (1F07hex | 7943dec) Description: UL temperature model – overtemperature		
	Response: Output stage inhibit	
	Cause	Measure
	The temperature of the active motor determined via the UL temperature model exceeds the maximum permitted motor temperature.	Check the motor for overload.

Error: 31.8 (1F08hex | 7944dec) Description: Temperature sensor motor 1 – communication timeout		
	Response: Output stage inhibit	
	Cause	Measure
	Communication with temperature sensor is disrupted (e.g. via MOVILINK® DDI).	Check the wiring of the temperature sensor.

Error: 31.9 (1F09hex | 7945dec) Description: Temperature sensor motor 1 – temperature too low		
	Response: Output stage inhibit	
	Cause	Measure
	Temperature detected by temperature sensor of fell below -50 °C.	– Check whether the correct temperature sensor has been configured. – Heat the motor.
	Short circuit in the long connection to the temperature sensor of the motor.	Check the wiring of the temperature sensor.

Error: 31.50 (1F32hex | 7986dec) Description: Error at temperature sensor 1		
	Response: Output stage inhibit	
	Cause	Measure
	Error detected at temperature sensor 1 of the motor.	Observe the error code of the main component. Identify the exact cause of this error message and take the appropriate measures to eliminate the error.

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Error: 31.51 (1F33hex | 7987dec) Description: Error at temperature sensor 2	
Response: Output stage inhibit	
Cause	Measure
Error detected at temperature sensor 2 of the motor.	Observe the error code of the main component. Identify the exact cause of this error message and take the appropriate measures to eliminate the error.

Error: 31.52 (1F34hex | 7988dec) Description: Error at temperature sensor 3	
Response: Output stage inhibit	
Cause	Measure
Error detected at temperature sensor 3 of the motor.	Observe the error code of the main component. Identify the exact cause of this error message and take the appropriate measures to eliminate the error.

12.7.20 Error 32 Communication

Error: 32.1 (2001hex | 8193dec) Description: CBus communication timeout	
Response: Fieldbus – timeout response	
Cause	Measure
A timeout occurred in the process data transfer during communication via the CBus communication option.	– Check the wiring of the system bus. – Make sure that the communication option is set correctly. – Check the set timeout time of the CBus communication option.

Error: 32.6 (2006hex | 8198dec) Description: Error while transferring parameter set	
Response: Output stage inhibit	
Cause	Measure
Error while downloading parameter set to device.	– Check the wiring of system bus and module bus. – Restart the transfer.

Error: 32.7 (2007hex | 8199dec) Description: Application heartbeat timeout	
Response: Application heartbeat – timeout response	
Cause	Measure
Communication between the application program (e.g. IEC program or MOVIKIT® from the Drive category) and the device was interrupted.	– Check the status of the application program. – Restart the application program.

Error: 32.8 (2008hex | 8200dec) Description: User-timeout timeout		
	Response: User timeout – timeout response	
	Cause	Measure
	The timeout time of the user timeout function has expired.	– Check communication. – If the error occurs repeatedly, contact SEW-EURODRIVE Service.

Error: 32.12 (200Chex | 8204dec) Description: Manual mode timeout		
	Response: Manual mode – timeout response	
	Cause	Measure
	Communication connection to inverter interrupted in manual mode.	– Check whether too many programs are open on the engineering PC. – Increase the timeout time in manual mode.
	New Scope project created.	– Acknowledge the fault. – Restart manual mode.
	Scope measurement transferred from inverter to project.	– Acknowledge the fault. – Restart manual mode.

12.7.21 Error 33 System initialization

Error: 33.1 (2101hex | 8449dec) Description: Error during offset determination of current measurement	
Response: Output stage inhibit	
Cause	Measure
Error detected during current measurement.	Contact SEW-EURODRIVE Service.

Error: 33.2 (2102hex | 8450dec) Description: Firmware – checksum error	
Response: Output stage inhibit System state: Fault acknowledgment with CPU reset	
Cause	Measure
Error calculating firmware checksum.	Contact SEW-EURODRIVE Service.

Error: 33.4 (2104hex | 8452dec) Description: Bootloader – checksum error	
Response: Output stage inhibit System state: Fault acknowledgment with CPU reset	
Cause	Measure
Error calculating bootloader checksum.	Contact SEW-EURODRIVE Service.

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Error: 33.6 (2106hex | 8454dec) Description: Faulty FPGA configuration		
	Response: Output stage inhibit	
	Cause	Measure
	Error in FPGA configuration.	Contact SEW-EURODRIVE Service.

Error: 33.7 (2107hex | 8455dec) Description: Function block compatibility error		
	Response: Output stage inhibit	
	Cause	Measure
	Error checking compatibility of function block.	Contact SEW-EURODRIVE Service.

Error: 33.8 (2108hex | 8456dec) Description: Software function block not configured correctly		
	Response: Output stage inhibit	
	Cause	Measure
	Error detected in the configuration of the software function block.	Contact SEW-EURODRIVE Service.

Error: 33.9 (2109hex | 8457dec) Description: Hardware compatibility error of the power section		
	Response: Output stage inhibit	
	Cause	Measure
	The firmware is not compatible with the hardware of the power section.	Contact SEW-EURODRIVE Service.

Error: 33.10 (210Ahex | 8458dec) Description: Boot timeout		
	Response: Output stage inhibit System state: Fault acknowledgment with CPU reset	
	Cause	Measure
	Timeout during system boot.	Contact SEW-EURODRIVE Service.

Error: 33.11 (210Bhex | 8459dec) Description: Hardware compatibility error		
	Response: Output stage inhibit	
	Cause	Measure
	The firmware is not compatible with the device.	Contact SEW-EURODRIVE Service.

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Error: 33.12 (210Chex | 8460dec) Description: Memory module plugged		
	Response: Output stage inhibit System state: Fault acknowledgment with CPU reset	
	Cause	Measure
	A plugged-in memory module was detected during device start. However, the internal memory was set as the storage location.	Switch off the device. Remove the memory module and restart the device.

Error: 33.13 (210Dhex | 8461dec) Description: Memory module removed		
	Response: Output stage inhibit System state: Fault acknowledgment with CPU reset	
	Cause	Measure
	Memory module removed from device parameterized for operation with replaceable memory module.	Switch off the device, insert the memory module, and switch on the device again.
	Replaceable memory module removed during ongoing operation.	Switch off the device, insert the memory module, and switch on the device again.
	Memory module missing for a device that can only be operated with replaceable memory module.	Switch off the device, insert the memory module, and switch on the device again.

Error: 33.14 (210Ehex | 8462dec) Description: EtherCAT® slave controller cannot be accessed		
	Response: Output stage inhibit System state: Fault acknowledgment with CPU reset	
	Cause	Measure
	EtherCAT® slave controller cannot be accessed.	Contact SEW-EURODRIVE Service.

Error: 33.15 (210Fhex | 8463dec) Description: Firmware configuration conflict in the Device Update Manager		
	Response: Output stage inhibit System state: Fault acknowledgment with CPU reset	
	Cause	Measure
	The firmware does not correspond with the expected configuration in the Device Update Manager.	– Acknowledge the fault. Doing so will update the configuration data of the Device Update Manager. – If the error occurs again after a reset, contact SEW-EURODRIVE Service.

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Error: 33.17 (2111hex | 8465dec) Description: Firmware parts not consistent		
	Response: Output stage inhibit	
	Cause	Measure
	Firmware update not executed completely.	Update the firmware again.

Error: 33.22 (2116hex | 8470dec) Description: Function status too low		
	Response: Output stage inhibit	
	Cause	Measure
	The parameter set to be loaded into the device requires a higher function status.	– Perform a firmware update. – Use a parameter set that matches the device. – Acknowledge the error with parameter set acceptance. This applies the data and overwrites the parameter set in the device with a lower function status.
	The parameter set in the replaceable memory module requires a higher function status.	– Perform a firmware update. – Use a memory module with a parameter set that matches the device. – Acknowledge the fault with parameter set acceptance. This applies the data and overwrites the replaceable memory module with a lower function status.

12.7.22 Error 34 Process data configuration

Error: 34.1 (2201hex | 8705dec) Description: Changed process data configuration		
	Response: Application stop + output stage inhibit	
	Cause	Measure
	Process data configuration changed during active process data operation.	Perform a reset. Doing so will stop the process data, apply the changes, and restart the process data.

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12.7.23 Error 35 Function activation

Error: 35.1 (2301hex | 8961dec) Description: Activation level – invalid activation key		
	Response: Emergency stop + output stage inhibit	
	Cause	Measure
	Activation key not entered properly.	Enter the activation key again.
	Activation key not created for this device.	Check the activation key.
	For a double-axis, the activation key of the wrong instance was entered in the device.	Enter the activation key for the assigned instance.
	Activation key entered for technology level in parameter "Application level – activation key".	Enter the activation key in the correct parameter.

Error: 35.2 (2302hex | 8962dec) Description: Application level too low	
Response: Emergency stop + output stage inhibit	
Cause	Measure
The activated software module requires a higher application level.	Determine the required application level ("Application level – required level" parameter) and enter its activation key.

Error: 35.3 (2303hex | 8963dec) Description: Technology level too low	
Response: Emergency stop + output stage inhibit	
Cause	Measure
An activated technology function requires a higher technology level.	Determine the required technology level ("Technology level – required level" parameter) and enter its activation key.

Error: 35.4 (2304hex | 8964dec) Description: Technology level – invalid activation key	
Response: Emergency stop + output stage inhibit	
Cause	Measure
Activation key not entered properly.	Enter the activation key again.
Activation key not created for this device.	Check the activation key.
For a double-axis, the activation key of the wrong instance was entered in the device.	Enter the activation key for the assigned instance.
Activation key entered for application level in parameter "Technology level – activation key".	Enter the activation key in the correct parameter.

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12.7.24 Error 44 Subcomponent power section

Error: 44.2 (2C02hex | 11266dec) Description: Overcurrent phase U	
Response: Remote – critical error	
Cause	Measure
The connected motor is too large.	Connect a smaller motor.
Acceleration too high.	Reduce the acceleration.
A short circuit occurred.	– Remove the short circuit on the motor connection. – Check the motor phases.
There is a problem with the output filter.	– Activate the output filter during startup of the drive train. – Check assignment of output filter and inverter.
Output stage defective.	Contact SEW-EURODRIVE Service.

Error: 44.3 (2C03hex | 11267dec) Description: Overcurrent phase V	
Response: Remote – critical error	
Cause	Measure
The connected motor is too large.	Connect a smaller motor.
Acceleration too high.	Reduce the acceleration.
A short circuit occurred.	– Remove the short circuit on the motor connection. – Check the motor phases.
There is a problem with the output filter.	– Activate the output filter during startup of the drive train. – Check assignment of output filter and inverter.
Output stage defective.	Contact SEW-EURODRIVE Service.

Error: 44.4 (2C04hex | 11268dec) Description: Overcurrent phase W	
Response: Remote – critical error	
Cause	Measure
The connected motor is too large.	Connect a smaller motor.
Acceleration too high.	Reduce the acceleration.
A short circuit occurred.	– Remove the short circuit on the motor connection. – Check the motor phases.
There is a problem with the output filter.	– Activate the output filter during startup of the drive train. – Check assignment of output filter and inverter.
Output stage defective.	Contact SEW-EURODRIVE Service.

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12.7.25 Error 51 Analog processing

Error: 51.1 (3301hex | 13057dec) Description: Current at analog current input too small		
	Response: Analog input – 4 mA limit undershot	
	Cause	Measure
	Input current at analog input below 4 mA.	– Check the wiring. – Check the parameterization of the analog input.

Error: 51.2 (3302hex | 13058dec) Description: Voltage/current changeover faulty		
	Response: Output stage inhibit	
	Cause	Measure
	The hardware configuration for switching between voltage input and current input on the basic unit does not match the parameterization of the analog input.	– Check the position of the switch for the current/voltage configuration or – Check the parameterization of the analog input.

12.8 Error description for gateway

12.8.1 Error 16 Startup

Error: 16.30 (101Ehex | 4126dec) Description: Faulty EtherCAT® EEPROM configuration state		
	Response: Warning	
	Cause	Measure
	EtherCAT®/SBusPLUS EEPROM not configured correctly.	Contact SEW-EURODRIVE Service.

12.8.2 Error 17 Internal computing error

Error: 17.7 (1107hex | 4359dec) Description: Exception error		
	Response: Warning	
	Cause	Measure
	Internal trap in CPU.	– Switch the device off and on again. – If the error occurs repeatedly, contact SEW-EURODRIVE Service.

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Error: 17.8 (1108hex | 4360dec) Description: Non-volatile data not loaded		
	Response: Warning System state: Fault acknowledgement with CPU reset	
	Cause	Measure
	The CPU has been restarted several times without firmware being fully initialized. The non-volatile data is not loaded, the default values remain active.	– Acknowledge the fault. – Check the voltage supply. – If the fault occurs repeatedly, contact SEW-EURODRIVE Service.

12.8.3 Error 18 Software error

Error: 18.3 (1203hex | 4611dec) Description: Task system – warning		
	Response: Warning	
	Cause	Measure
	Error detected while processing internal task system.	– Acknowledge the warning. – If the warning occurs repeatedly, contact SEW-EURODRIVE Service.

Error: 18.4 (1204hex | 4612dec) Description: Task system – error		
	Response: Warning System state: Fault acknowledgement with CPU reset	
	Cause	Measure
	Error detected while processing internal task system.	– Switch the device off and on again. – If the error occurs repeatedly, contact SEW-EURODRIVE Service.

Error: 18.7 (1207hex | 4615dec) Description: Fatal software error		
	Response: Warning System state: Fault acknowledgement with CPU reset	
	Cause	Measure
	Fatal software error.	– Switch the device off and on again. – If the error occurs repeatedly, contact SEW-EURODRIVE Service.

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Error: 18.8 (1208hex | 4616dec) Description: Invalid fault code		
	Response: Warning	
	Cause	Measure
	Invalid fault code requested.	– Switch the device off and on again. – If the fault occurs repeatedly, contact SEW-EURODRIVE Service.

Error: 18.9 (1209hex | 4617dec) Description: Internal software error		
	Response: Warning System state: Fault acknowledgement with CPU reset	
	Cause	Measure
	The software signaled an unexpected event.	– Switch the device off and on again. – If the fault occurs repeatedly, contact SEW-EURODRIVE Service.

Error: 18.10 (120Ahex | 4618dec) Description: Watchdog error		
	Response: Warning	
	Cause	Measure
	Watchdog has detected an error. The software is not operating within the intended cycle time.	– Switch the device off and on again. – If the error occurs repeatedly, contact SEW-EURODRIVE Service.

12.8.4 Error 20 Device monitoring

Error: 20.1 (1401hex | 5121dec) Description: Supply voltage fault		
	Response: Warning System state: Fault acknowledgement with CPU reset	
	Cause	Measure
	Internal electronics supply voltage or externally connected DC 24 V supply voltage not within permitted voltage range.	– Check the voltage level of the external DC 24 V supply voltage and check for correct connection. – Acknowledge the fault. – If the fault occurs repeatedly, contact SEW-EURODRIVE Service.
	24 V power supply unit overloaded.	Check the project planning for the power demand.

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Error: 20.7 (1407hex | 5127dec) Description: Internal hardware fault		
	Response: Warning System state: Fault acknowledgement with CPU reset	
	Cause	Measure
	Fault in device hardware.	– Acknowledge the fault. – If the fault occurs repeatedly, replace the device.

Error: 20.31 (141Fhex | 5151dec) Description: Supply voltage on gateway overloaded		
	Response: DC 24 V switch off gateway station	
	Cause	Measure
	The connected CBus stations overload the DC 24 V supply voltage at the gateway.	– Check the cabling. – Reduce the number of CBus stations.

12.8.5 Error 25 Parameter memory monitoring

Error: 25.1 (1901hex | 6401dec) Description: Timeout warning		
	Response: Warning with self-reset	
	Cause	Measure
	Access to memory (read/write) takes longer than expected.	No measure required. The fault will be reset automatically after completed memory access.

Error: 25.2 (1902hex | 6402dec) Description: Non-volatile memory system — runtime error		
	Response: Warning System state: Fault acknowledgement with CPU reset	
	Cause	Measure
	Runtime error in non-volatile memory system.	– Switch the device off and on again. – Restore delivery state. Note that doing so will reset all data in the non-volatile memory to the values at delivery. – If the error occurs repeatedly, replace the device/memory module. Contact SEW-EURODRIVE Service. – Perform basic initialization. Contact SEW-EURODRIVE Service for this purpose.

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Error: 25.6 (1906hex | 6406dec) Description: Incompatible device configuration		
	Response: Warning	
	Cause	Measure
	The data set of another device was copied in the device, which differs in device family, power, or voltage from the current device.	– Acknowledge the fault through a manual fault reset. To do so, under [Diagnostics] > [Status] > [Fault status] in the "Manual fault reset" parameter, select the "With parameter set acceptance" setting. – Restore delivery state. Note that doing so will reset all data in the non-volatile memory to the values at delivery.
	The replaceable memory module of another device that differs from the current device with regard to the device family, power, voltage, or design, for example, has been inserted in the device.	– Insert the correct memory module. – Acknowledge the fault through a manual fault reset. To do so, under [Diagnostics] > [Status] > [Fault status] in the "Manual fault reset" parameter, select the "With parameter set acceptance" setting. – Restore delivery state. Note that doing so will reset all data in the non-volatile memory to the values at delivery. – Perform basic initialization. Contact SEW-EURODRIVE Service for this purpose.
	The power section has been replaced and differs in its power rating and voltage from the original power section.	– Insert the correct power section. – Acknowledge the fault through a manual fault reset. To do so, under [Diagnostics] > [Status] > [Fault status] in the "Manual fault reset" parameter, select the "With parameter set acceptance" setting. – Restore delivery state. Note that doing so will reset all data in the non-volatile memory to the values at delivery.
	Subcomponent defective.	Contact SEW EURODRIVE Service.

Error: 25.7 (1907hex | 6407dec) Description: Non-volatile memory system – initialization error		
	Response: Warning	
	Cause	Measure
	Initializing non-volatile memory system failed.	– Switch the device off and on again. – Restore delivery state. Note that doing so will reset all data in the non-volatile memory to the values at delivery. – If the error occurs repeatedly, contact SEW-EURODRIVE Service. – Perform basic initialization. Contact SEW-EURODRIVE Service for this purpose.

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Error: 25.20 (1914hex | 6420dec) Description: Basic device memory – initialization error		
	Response: Warning	
	Cause	Measure
	Initialization of basic device memory failed.	Contact SEW-EURODRIVE Service.

Error: 25.21 (1915hex | 6421dec) Description: Basic device memory – runtime error		
	Response: Warning	
	Cause	Measure
	Runtime error detected in the basic device memory.	Contact SEW-EURODRIVE Service.

Error: 25.50 (1932hex | 6450dec) Description: Replaceable memory module of safety option – runtime error		
	Response: Warning System state: Fault acknowledgement with CPU reset	
	Cause	Measure
	Runtime error detected in the replaceable memory module of the safety option.	Contact SEW-EURODRIVE Service.

Error: 25.61 (193Dhex | 6461dec) Description: Restore point – error		
	Response: Warning	
	Cause	Measure
	Failed to create restore point.	Create the restore point again.

12.8.6 Error 32 Communication

Fault: 32.3 (2003hex | 8195dec) Description: Faulty synchronization signal		
	Response: External synchronization	
	Cause	Measure
	Synchronization signal period is not correct.	Make sure that the EtherCAT®/SBusPLUS configuration in the controller is set correctly.

Fault: 32.4 (2004hex | 8196dec) Description: Missing synchronization signal		
	Response: External synchronization	
	Cause	Measure
	No synchronization signal present.	Make sure that the EtherCAT®/SBusPLUS configuration in the controller is set correctly.

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Fault: 32.5 (2005hex | 8197dec) Description: Synchronization timeout		
	Response: External synchronization	
	Cause	Measure
	Timeout while synchronizing to synchronization signal.	Make sure that the EtherCAT®/SBusPLUS configuration in the controller is set correctly.

Fault: 32.6 (2006hex | 8198dec) Description: Error while transferring parameter set		
	Response: Warning	
	Cause	Measure
	An error was detected while transferring the parameter set to the device.	– Check the wiring of system bus and module bus. – Restart the transfer.

Fault: 32.16 (2010hex | 8208dec) Description: CBus PI data timeout		
	Response: Process data lock gateway station	
	Cause	Measure
	One or more stations on the CBus no longer respond.	– Check CBus cabling. – Check whether CBus stations are switched on.

12.8.7 Fault 33 System initialization

Error: 33.2 (2102hex | 8450dec) Description: Firmware – checksum error		
	Response: Warning System state: Fault acknowledgment with CPU reset	
	Cause	Measure
	Error calculating firmware checksum.	Contact SEW-EURODRIVE Service.

Error: 33.8 (2108hex | 8456dec) Description: Software function block not configured correctly		
	Response: Warning	
	Cause	Measure
	Error detected in the configuration of the software function block.	Contact SEW-EURODRIVE Service.

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Error: 33.10 (210Ahex | 8458dec) Description: Boot timeout		
	Response: Warning System state: Fault acknowledgment with CPU reset	
	Cause	Measure
	Timeout during system boot.	Contact SEW-EURODRIVE Service.

Error: 33.11 (210Bhex | 8459dec) Description: Hardware compatibility error		
	Response: Warning	
	Cause	Measure
	The firmware is not compatible with the device.	Contact SEW-EURODRIVE Service.

Error: 33.15 (210Fhex | 8463dec) Description: Firmware configuration conflict in the Device Update Manager		
	Response: Warning System state: Fault acknowledgment with CPU reset	
	Cause	Measure
	The firmware does not correspond with the expected configuration in the Device Update Manager.	– Acknowledge the fault. Doing so will update the configuration data of the Device Update Manager. – If the error occurs again after a reset, contact SEW-EURODRIVE Service.

Error: 33.18 (2112hex | 8466dec) Description: Incompatible fieldbus configuration		
	Response: Warning System state: Fault acknowledgment with CPU reset	
	Cause	Measure
	The fieldbus used is not compatible with the basic unit.	– For devices with a pluggable fieldbus card, replace the card. – If the error occurs repeatedly, contact SEW-EURODRIVE Service.

Error: 33.19 (2113hex | 8467dec) Description: Timeout CBus auto addressing		
	Response: Process data lock gateway station	
	Cause	Measure
	At device startup, auto-addressing was not completed properly within the timeout time. No address was assigned.	– Check the connection between the communication module and the gateway. – Check the function of the communication module and the gateway.

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Error: 33.20 (2114hex | 8468dec) Description: Number of CBus stations too large		
	Response: DC 24 V switch off gateway station	
	Cause	Measure
	More than 8 CBus stations detected by auto addressing at device startup.	Reduce the number of CBus stations.

Error: 33.21 (2115hex | 8469dec) Description: Station configuration changed		
	Response: Process data lock gateway station with self-reset	
	Cause	Measure
	The number of lower-level members does not match the number of configured members.	Remove or add members.

12.8.8 Error 34 Process data configuration

Error: 34.1 (2201hex | 8705dec) Description: Changed process data configuration		
	Response: Warning	
	Cause	Measure
	Process data configuration changed during active process data operation.	Perform a reset. Doing so will stop the process data, apply the changes, and restart the process data.

Error: 34.2 (2202hex | 8706dec) Description: Invalid process data configuration		
	Response: Warning with self-reset	
	Cause	Measure
	An invalid process data configuration has been set on the controller.	– Select a valid process data configuration. – Set the quantity of process data according to the product manual.

Error: 34.3 (2203hex | 8707dec) Description: Quantity of configured process data too low		
	Response: Warning with self-reset	
	Cause	Measure
	Too little process data is transferred from the controller.	– Select a valid process data configuration. – Reduce the number of axes connected to the gateway.

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Error: 34.4 (2204hex | 8708dec) Description: Quantity of configured process data too high		
	Response: Warning with self-reset	
	Cause	Measure
	Too much process data is transferred from the controller.	– Select a valid process data configuration. – Increase the number of axes connected to the gateway.

12.8.9 Error 35 Function activation

Error: 35.1 (2301hex | 8961dec) Description: Activation level – invalid activation key		
	Response: Warning	
	Cause	Measure
	Activation key not entered properly.	Enter the activation key again.
	Activation key not created for this device.	Check the activation key.
	For a double-axis, the activation key of the wrong instance was entered in the device.	Enter the activation key for the assigned instance.
	Activation key entered for technology level in parameter "Application level – activation key".	Enter the activation key in the correct parameter.

Error: 35.2 (2302hex | 8962dec) Description: Application level too low		
	Response: Warning	
	Cause	Measure
	The activated software module requires a higher application level.	Determine the required application level ("Application level – required level" parameter) and enter its activation key.

Error: 35.3 (2303hex | 8963dec) Description: Technology level too low		
	Response: Warning	
	Cause	Measure
	An activated technology function requires a higher technology level.	Determine the required technology level ("Technology level – required level" parameter) and enter its activation key.

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Error: 35.4 (2304hex | 8964dec) Description: Technology level – invalid activation key		
	Response: Warning	
	Cause	Measure
	Activation key not entered properly.	Enter the activation key again.
	Activation key not created for this device.	Check the activation key.
	For a double-axis, the activation key of the wrong instance was entered in the device.	Enter the activation key for the assigned instance.
	Activation key entered for application level in parameter "Technology level – activation key".	Enter the activation key in the correct parameter.

12.8.10 Error 45 Fieldbus interface

Error: 45.1 (2D01hex | 11521dec) Description: No response from fieldbus interface		
	Response: Warning	
	Cause	Measure
	Fieldbus interface does not start properly and is therefore not functional.	– Switch the device off and on again. – If the fault occurs repeatedly, contact SEW-EURODRIVE Service.

Error: 45.2 (2D02hex | 11522dec) Description: Fieldbus interface – fault		
	Response: Fieldbus – timeout response	
	Cause	Measure
	Error detected on device-internal connection to fieldbus interface.	– Switch the device off and on again. – If the fault occurs repeatedly, contact SEW-EURODRIVE Service.

Error: 45.3 (2D03hex | 11523dec) Description: Process output data timeout		
	Response: Fieldbus – timeout response	
	Cause	Measure
	Timeout in process data transfer during fieldbus communication.	– Check the communication connection between the fieldbus master and the fieldbus interface for interruption. – Check the configuration of the fieldbus master. – Adjust the timeout monitoring of the fieldbus interface.

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Error: 45.5 (2D05hex | 11525dec) Description: Engineering error		
	Response: Warning	
	Cause	Measure
	Engineering via fieldbus interface no longer works or only works to a limited extent.	– Switch the device off and on again. – Check the network load in the communication network. – Close unneeded engineering connections that are open in parallel (e.g. parameter access via managing EDGE devices, asset management tools, network scanners, etc.). – If the error occurs repeatedly, contact SEW-EURODRIVE Service.

Error: 45.7 (2D07hex | 11527dec) Description: Invalid process output data		
	Response: Fieldbus – timeout response	
	Cause	Measure
	– The fieldbus master sends invalid process output data. – The fieldbus interface has detected an internal failure of the process data exchange and marks the process output data as invalid.	– Check whether the PLC is in "Stop" state. – Restart the PLC. – Check the configuration of the fieldbus master. – In the event of a failure of the internal process data exchange, switch the device off and then on again.

Error: 45.9 (2D09hex | 11529dec) Description: Warning		
	Response: Warning	
	Cause	Measure
	Inverter detected non-critical fault on device-internal connection to fieldbus interface.	– Switch the device off and on again. – If the warning occurs repeatedly, contact SEW-EURODRIVE Service.

Error: 45.50 (2D32hex | 11570dec) Description: Warning		
	Response: Warning with self-reset	
	Cause	Measure
	Fieldbus interface signals a warning.	Observe the warning of the fieldbus interface subcomponent. Identify the exact cause of this warning and take the appropriate measures for elimination.

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Error: 45.51 (2D33hex | 11571dec) Description: Fault		
	Response: Fieldbus – timeout response	
	Cause	Measure
	Fieldbus interface detected a fault.	Observe the fault code of the fieldbus interface subcomponent. Identify the exact cause of this fault message and take the appropriate measures to eliminate the fault.

Error: 45.52 (2D34hex | 11572dec) Description: Critical fault		
	Response: Fieldbus – timeout response	
	Cause	Measure
	Fieldbus interface detected a critical fault.	Observe the fault code of the fieldbus interface subcomponent. Identify the exact cause of this fault message and take the appropriate measures to eliminate the fault.

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12.9 Device replacement

Device replacement is only possible if an identical replacement device with the same or later firmware version is used. Deviating device configurations lead to fault E25.06 and can be acknowledged with parameter acceptance. The device can then be used without further startup. If a device needs to be replaced, the following procedures apply.

12.9.1 Using MOVISUITE®

The MOVISUITE® engineering software can be used to export and import parameter and configuration settings.

12.9.2 Using a CBG.. keypad

When using a keypad, the parameter and configuration settings can be stored on the keypad. By plugging the keypad into another inverter and activating data transmission, data is transferred to the inverter. After the transmission is complete, the inverter is immediately ready for operation for the specific application.

12.9.3 Using a MOVI-C® CONTROLLER

The "Update configuration" function can be started using the MOVISUITE® engineering software at any time, usually after completed startup of the devices and the controller.

Using this function, all parameter and configuration settings of the devices and the controller are saved on the memory card of the controller and are provided with a checksum.

When the controller is switched on, the data on the memory card and the data on the connected device are compared in a test to see if they match. In case a defective device has been replaced previously, the controller recognizes that the data on the memory card does not match the data of the new device. In this case, the controller loads the data of the memory card to the device.

In addition, changes in the device that have not been saved using the "Update configuration" function are overwritten. The process is performed automatically.

If the data management (axis data set recovery) of the MOVI-C® CONTROLLER is used, the parameter and configuration settings of the controller are always transferred to the inverter.

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12.10 SEW-EURODRIVE Service

12.10.1 Sending in a device for repair

If a fault cannot be repaired, contact SEW-EURODRIVE Service, see chapter "Contacting SEW-EURODRIVE" (→ 🗎 215).

Always specify the digits of the status label when contacting the SEW-EURODRIVE electronics service team. This will enable our Service personnel to assist you more effectively.

Provide the following information when sending the device in for repair:

- Serial number (see nameplate)
- Type designation
- Unit design
- Short description of the application (application, control type, etc.)
- Type of fault
- Accompanying circumstances
- Your own presumptions
- Unusual events preceding the problems, etc.

12.11 Shutdown

⚠ WARNING

Electric shock due to incompletely discharged capacitors.

Severe or fatal injuries.

- Observe a minimum switch-off time of 10 minutes after disconnecting the power supply.

To shut down the device, de-energize the device using appropriate measures.

⚠ WARNING

Risk of burns due to hot surfaces.

Severe injuries.

- Let the devices cool down before touching them.

12.12 Extended storage

The following table shows the intervals and measures that are relevant for extended storage of the inverters. For all other inverters, no measures are required.

Time interval	Every 2 years
Inverter with 1-phase line connection	Line connections: Connect devices to the line voltage for 5 minutes.

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Measures in the event of omitted maintenance

Increase line voltage in stages. The following graduations are recommended:

- Stage 1: AC 0 to 170 V within a few seconds
- Stage 2: AC 170 V for 15 minutes
- Stage 3: AC 200 V for 15 minutes
- Stage 4: AC 240 V for 1 hour

12.13 Waste disposal

Dispose of the product and all parts separately in accordance with their material structure and the national regulations. Put the product through a recycling process or contact a specialist waste disposal company. If possible, divide the product into the following categories:

- Iron, steel or cast iron
- Stainless steel
- Magnets
- Aluminum
- Copper
- Electronic parts
- Plastics

The following materials are hazardous to health and the environment. These materials must be collected and disposed of separately:

- Oil and grease

  Collect used oil and grease separately according to type. Ensure that the used oil is not mixed with solvent. Dispose of used oil and grease correctly.
- Screens
- Capacitors

Waste disposal according to WEEE Directive 2012/19/EU

This product and its accessories may fall within the scope of the country-specific application of the WEEE Directive. Dispose of the product and its accessories according to the national regulations of your country.

For further information, contact the responsible SEW-EURODRIVE branch or an authorized partner of SEW-EURODRIVE.

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13 Inspection and maintenance

The device is maintenance-free. SEW-EURODRIVE does not stipulate any regular inspection work. However, it is recommended that you check the following components regularly:

- **Connection cables:**

  If cables become damaged or fatigued, replace them immediately.
- **Cooling fins:**

  Remove any deposits to ensure sufficient cooling.

INFORMATION

Only SEW-EURODRIVE may repair the devices.

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14 Appendix

14.1 Abbreviation key

The following table lists the abbreviations that are used in the documentation together with their unit and meaning.

Abbreviation	Unit	Meaning
ASM	–	Asynchronous motor
BG..	–	Inverter size
C	µF	Capacitance
f_{max}	Hz	Maximum output frequency
f_{max}	Hz	Maximum input frequency (encoder input)
f_{line}	Hz	Line frequency
f_{PWM}	kHz	Frequency of the pulse width modulation
h	m	Installation altitude
HF	–	High frequency
I_F	A	Tripping current (braking resistor)
I_{max}	A	Maximum DC link current (specification on the nameplate)
I_{max}	A	Maximum output current (encoder interface)
I_{peak}	A	Output peak current (encoder interface)
I_{A_max}	A	Maximum output current
I_{Appl}	A	Total current of the application
I_{Cont}	A	Continuous output current
I_N	A	Nominal output current/nominal current (filter, choke)
I_{line}	A	Nominal line current
I_{DCL_nom}	A	DC link current
L_N	mH	Inductance
LSPM	–	Line Start Permanent Magnet
asl	m	Above sea level, reference for altitudes above sea level
P_{rms}	kW	Effective power (braking resistor)
P_{max}	kW	Maximum power (braking resistor)
P_{Mot}	kW	Motor power of the asynchronous motor
P_N	kW	Nominal motor power (rated power)
P_V	W	Power loss
PWM	–	Pulse width modulation
R_{BR}	Ω	Value of the braking resistance
R_{BR_min}	Ω	Minimum value of the braking resistance
R_i	Ω	Input resistance
S_N	kVA	Apparent output power

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Abbreviation	Unit	Meaning
SM	–	Synchronous motor
V_A	V	Inverter output voltage
V_{BR}	V	Brake supply voltage
V_{Drop}	V	Voltage drop
V_N	V	Nominal line voltage (filter, choke)
V_{line}	V	Connection voltage
V_{DCL_nom}	V	Nominal DC link voltage
V_{DCL}	V	DC link voltage
V_{out}	V	DC 24 V to supply STO_P1 and STO_P2
V_S	V	Supply voltage of encoders
V_{S12VG}	V	DC 12 V supply voltage of encoders
V_{S24VG}	V	DC 24 V supply voltage of encoders
V_{I24}	V	Voltage supply for electronics and brake
ϑ_A	°C	Ambient temperature
+ES	–	... with output stage inhibit

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15 Contacting SEW-EURODRIVE

You can find the worldwide contact data and locations on the **SEW-EURODRIVE website** via the following link or the QR code shown below.

https://www.sew-eurodrive.de/contacts-worldwide

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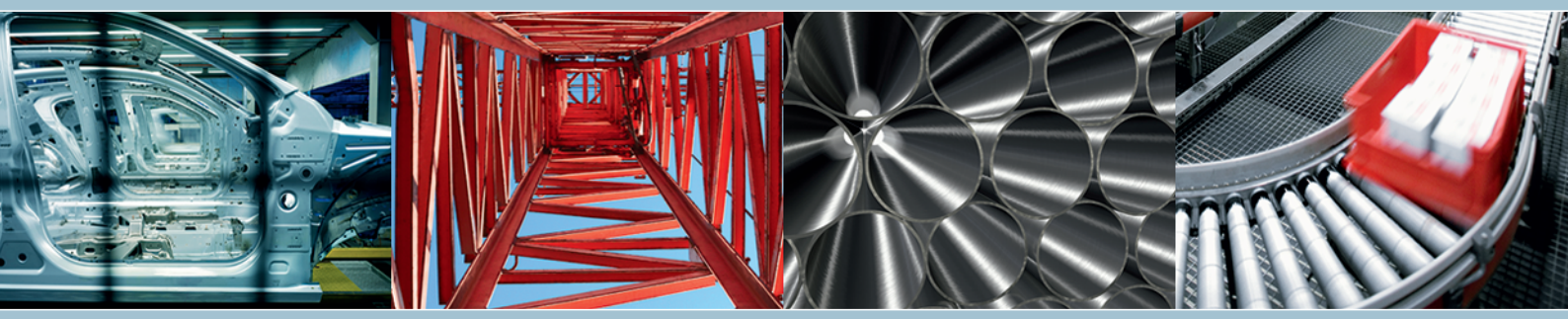

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